

THE MODEL ENGINEER

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The MODEL ENGINEER

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SMOKE RINGS

Our Cover Picture

● THE SUBJECT of our illustration this week is the very colourful model of the spritsail barge *Invicta*, made by Commander E. T. Brook, who is seen on the left of the picture. The photograph was taken at the Prototype Sailing Models Regatta at Hove last July, where the model delighted the spectators by her realistic appearance as she cruised about the lake. She is of the ketch or “mulie” type, with a spritsail on the main, and a gaff sail on the mizzen, and thus represents the type of craft used for coastal rather than river work. The firm of T. F. Everard & Sons had four large vessels of this type, built of steel, in the 1920’s. With their white hull and rig, these were among the largest and finest examples of the spritsail barge to be found around our coasts.

An “M.E.” Exhibition Prize-giving

● WE HAVE already announced that, on the Royal Navy stand at the “M.E.” Exhibition, there will be a number of models that have been built by officers and men of the Royal Navy, and are to be judged by our judges; we are providing the “Royal Navy” Cup to be awarded to the best entry, the runners-up to receive certificates of merit, where deserved.

We are very pleased to be able to add that, on Monday, October 27th, Admiral Sir Alec

Madden, C.G., K.C.B., C.B.E., Second Sea Lord, will visit the exhibition, to present the prizes to the R.N. competitors.

The Price of Progress

● RECENT TRAGIC events in the field of high-speed research on land, air and water have served as a grim reminder of the toll which must be paid for every step forward in science and engineering. Lives of brilliant and intrepid workers who can ill be spared have been lost in the attempt to beat speed records, and it is perhaps natural that many people, deploring these tragedies, should ask “What good is all this craze for speed—where is it leading us?” But though it may not be clear at the moment what good purpose these attempts can serve, the lessons of the past show that nearly all the material progress of the present age, including the safety and comfort of modern travel in all three spheres, is due to the efforts of pioneers who have devoted, and in many cases sacrificed, their lives to the pursuit of the elusive, and the exploration of the unknown.

The world may deplore the apparent futility of the quest, but history will show that it has never been in vain. In the words of one of the recent victims of progressive research, “We must press on!” and these words may be used as a fitting epitaph for those who fall in the vanguard of this hard-fought campaign.

Radio Control

● THE PROGRESS made in the radio control of boats during the last year was demonstrated effectively at the regattas held recently at Blackpool and at Poole. In addition to the control of steering, various other operations have been carried out, such as towing a weighted balloon, releasing it, and then manoeuvring to puncture it, throwing out a mark buoy which flares on

the usual vane steering gear. Other demonstrations of radio control will be included, and altogether the event should be one which will have a great bearing in the future of model yachting.

Old Faithful

● IN OUR issue of June 12th last, we published the first of two articles by Mr. Ian Bradley



Mr. Carrington-Wood's 2 ft. model approaching the yard-wide finishing line

touching the water, and so on. Our photograph was taken at Poole, and shows Mr. G. Carrington-Wood's electrically-driven model approaching the finishing line, which was between two poles, placed only a yard apart. As the little boat approached the line it seemed uncertain that she would make it, so she was stopped, reversed for a yard or two, and then went forward again to make a perfect crossing, to the accompaniment of loud cheers from the spectators. But the greatest advance was shown in the handling of model yachts. At the Poole regatta, Mr. G. Honnest-Redlich raced his "A" class yacht with Lt.-Col. C. E. Bowden's 10-rater, both yachts being under radio control. This is, we believe, the very first time yachts have been raced under radio control, and the respective sets functioned perfectly, in spite of the narrow wave band allowed by the G.P.O. The yachts were raced around a triangular course under the full-sized yacht racing rules. At one time the boats were so close that the crowd held its breath anticipating a collision, but the boats responded perfectly to their skipper's and sheered off in true racing style.

To demonstrate the value of radio control for racing yachts, our companion magazine, *Model Ships and Power Boats* will be staging a race between a radio-controlled yacht, and one with

describing the two fine old pumping engines at Crofton, Wilts. Mr. R. D. Fallowfield, of Liverpool, has sent us a cutting from *The Liverpool Echo* of the following day; it reads:—

"A James Watt beam-engine at a Midlands ironworks has had its first major breakdown after being bought second-hand a century ago. It has been working 140 years in all."

There may be something of an interesting coincidence here; but, up to the moment of writing this note, we have been unable to identify the engine referred to, and hope that some reader may be able to give us further information.

However, just think of it! An engine that was already 40 years old when it was bought and, presumably, installed at its present site, 100 years ago! This is faithful service which far surpasses anything of the kind that can be placed to the credit of any human being, or, for that matter, any beast of burden. It is rather an appalling thought that, today, it is to machines, and mostly old machines at that, to which man has to turn for patient and unswerving service. Is it this fact, or a feeling of jealousy arising from it, that causes some humans to hate the sight of many a fine old engine, and to wish for nothing but ruthlessly scrapping it? To such people, thoughts like ours are merely pure sentimentality. We wonder!



THE "MODEL ENGINEER" EXHIBITION

What to see

on The Trade Stands

THIS year, our friends of the trade have warmly welcomed the later date of the MODEL ENGINEER Exhibition and appear to have prepared a more than usually comprehensive display of their products. As a whole, visitors will see that the model engineering manufacturers and dealers cover practically every need of the hobby; individually, the trade displays are sure to interest somebody at any time during the run of the exhibition. There is scarcely any need for us to add, in parenthesis, that no exhibition ever interested everybody *all* the time!

Associated Iliffe Press,
Dorset House,
Stamford Street,
London, S.E.1.
Stand 32.

The well-known technical journals published by this organisation, including the *Amateur Photographer*, *The Autocar*, *Flight*, *The Motor Cycle*, *Wireless World* and *Yachting World* constitute the main feature of this stand's display.

In addition, a number of technical books on many subjects of interest to model engineers are exhibited.

Bassett-Lowke Ltd., 16-20, St. Andrews Street, Northampton. Stand 22.

Here are displayed boiler fittings, castings and parts for the construction of live steam locomotives in 2½-in. and 3½-in. gauges and for ¾-in. and 1½-in. scale traction engines. Castings for the famous locomotive *Royal Scot* in 7½-in. and 10½-in. gauges may also be inspected, as well as a selection of various types of machinery for model boats and a range of ships' fittings and parts for model boat construction. A working model railway in "O" gauge is demonstrating various electrically-operated models and the very latest "O" gauge locomotive, *The Prince Charles*, which is available for either clockwork or electric layouts.

Black & Decker Ltd., Harmondsworth, Middlesex. Stand 34.

This firm produces the largest range of portable

electrical tools, and the main feature of their display is the range of "Handy-Utility" electric tools and accessories.

These tools, which have recently been the subject of a review in *THE MODEL ENGINEER*, comprise an efficient and compact electrically driven hand drill which can be converted by the addition of simple attachments to serve as a sensitive drilling machine, bench grinder, etc., also for sanding, polishing and scratch-brushing.

The usefulness of these tools, not only for the home craftsman, but also for the professional

engineer, has been fully proved, and their capacity is equal to that of much more expensive types of industrial tools.

British Model Aircraft Manufacturing Co. Ltd.,
180, London Road, Mitcham.
Stand 28.

This firm's products need no introduction to model aircraft enthusiasts with whom their "Sky-leads" and "Sky-rova" construction kits are

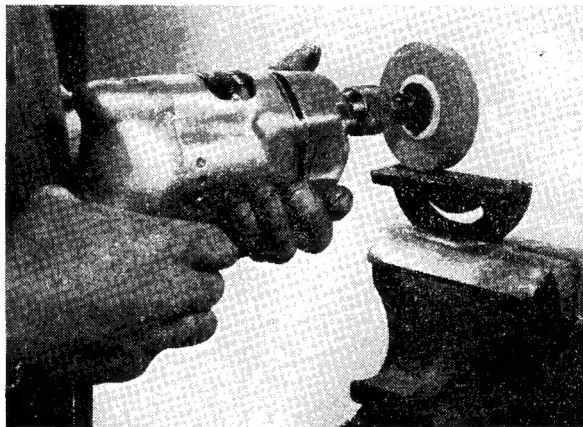
already well known. On their stand they are showing many models from their very extensive range of kits, including their two latest products which have been designed especially for beginners—the "Fledgling" 26 in. span rubber-driven duration model and the Point Five 31 in. span semi-scale free flight power model.

Also on this stand there is a display of Solarbo balsa wood.

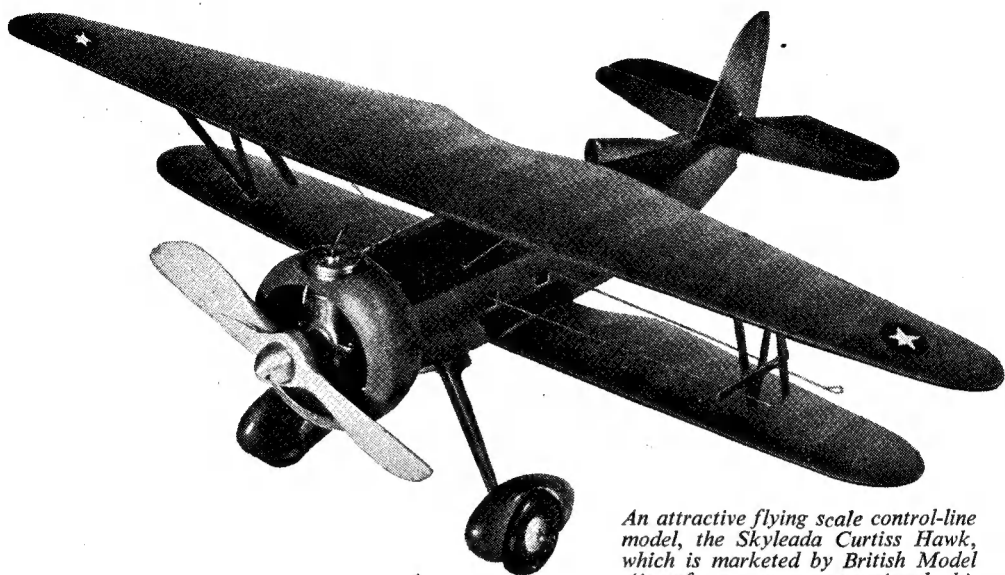
Buck & Ryan Ltd., 310-312, Euston Road, London, N.W.1. Stands 19 and 20.

The display of tools by this well-known firm has become practically a permanent institution at *THE MODEL ENGINEER* Exhibition, and is always the centre of interest to enthusiasts who demand the best in fine tools of all kinds.

A fully up-to-date selection of lathes, drilling machines, hand tools, micrometers, chucks, calipers, files, drills, taps, dies, angle plates and machine fixtures are displayed and demonstrated.



The "Handy-Utility" electric drill in use as a grinder



An attractive flying scale control-line model, the Skylead Curtiss Hawk, which is marketed by British Model Aircraft as a constructional kit

Burnett Machine Tool Co. Ltd., Burnett House, Hytongate, Hull. Stand 49.

The most important feature of this stand is the "Granville Senior" lathe, which is designed for modelmaking and also for industrial use.

This lathe, which has recently been reviewed in *THE MODEL ENGINEER*, is of specially robust construction, so as to be capable of standing up to heavy duty, and has many advantages over the earlier type of "Granville" Lathe, though the latter is still available.

A range of accessories for these lathes, including angle and face plates, travelling and fixed steadies, milling slides and chucks are also shown.

F. Burnerd & Co. Ltd., Government Buildings, Kidbrooke Park Road, London, S.E.3. Stand 5.

We welcome an old friend of *THE MODEL ENGINEER* again to this Exhibition after an absence of many years.

The Burnerd chucks have long been popular among model engineers, and their early reputation has been enhanced by increased accuracy, due to improved methods of production.

A new feature of great interest is the Burnerd mounted chuck, which dispenses with the need for the usual backplate or other form of adaptor to fit the lathe mandrel nose. As a result, the overhang of the chuck is greatly reduced, increasing the rigidity both of the chuck, and the work which it holds, and also increasing the length which can be accommodated in the chuck.

Another very interesting feature is the new Burnerd interchangeable tool post, introduced for the first time this year, which enables an unlimited range of tools to be used, each tool being brought into action quickly, and automatically registered to fine limits when placed in the holder and clamped down by a single hand-operated lever.

Chloride Batteries Ltd., Exide Works, near Manchester. Stand 27.

Exide batteries need no introduction to engineers, having been used for all purposes for which low voltage electricity is required, for very many years.

The display features small Exide accumulators and Drydex dry batteries suitable for all electrically driven models and other small applications, combining maximum efficiency with minimum weight.

A feature of particular interest is the Exide J.S.P. two-cell accumulator in a tough transparent moulded polystyrene container, which was chosen and exhibited by the Festival of Britain authorities last year as representing the highest point yet achieved in the design of this type of accumulator.

R. J. Deaves, 57, Tennyson Road, Small Heath, Birmingham. 10. Stand 15.

For several years now, Mr. Deaves' stand at the Exhibition has constantly been a centre of interest to visitors, and his demonstrations of his inexpensive combination tool have been both interesting and instructive.

The ease with which this tool carries out its many functions, including glass cutting, and sharpening of edged tools, must be seen to be believed.

Electronic Developments (Surrey) Ltd., 18, Villiers Road, Kingston-upon-Thames, Surrey. Stand 30.

The products of this firm are well-known to all model engineers, and include a wide range of model compression ignition engines for model aircraft, power boats and cars, also radio control units, components and accessories for same.

A feature of particular interest at this stand is a radio-controlled boat *Miss Eedee*—the first model boat to cross the English Channel.

Demonstrations of the control gear of this boat and also of a radio-controlled model yacht, which includes control of the main and jib sheets and rudder, will take place throughout the Exhibition.

Graham Farish Ltd., Mason's Hill, Bromley, Kent. Stand 21.

This firm's scale model railway locomotives, rolling-stock and accessories for "OO" gauge have won wide renown, and a large selection of them, old as well as new, can be seen at this stand. Some special models produced for export are also on view. The chief feature of these exhibits is that, although they are of the less expensive kind, they are well to scale.

Hamblings, 10, Cecil Court, London, W.C.2. Stands 39 and 41.

The name of Hambling is now universally accepted as that of the pioneer of "OO" gauge, and the display on these two stands must certainly cover every need in this popular size. Constructional parts for a wide range of locomotives, passenger and goods rolling-stock, signals, stations, track and every kind of accessory are to be found here. There is also a selection of "BILTEEZ" buildings and lineside constructional cards, specially produced to facilitate the making of attractive buildings, etc.

Heller & Sons (Engineers) Ltd., Turnpike Lane, Hornsey, London, N.8. Stand 50.

This firm makes a speciality of marking devices of all descriptions, and their stand features various types, including monograms, stamps and seals in attractive and inexpensive designs.

Kennion Bros. (Hertford) Ltd., 2 and 2A, Railway Place, Hertford. Stand 31.

Followers of "L.B.S.C.'s" instructive notes, so well known as "the words and music," will find here blueprints and castings for all types of his many locomotives; also for Kennions' own 5-in. gauge L.M.S. 0-6-0 tank engine and the Austen-Walton "Twin Sisters." Locomotive boilers of various types are also specialities by this firm and examples can be seen on this stand. Kennion Bros. are one of the principal suppliers of all kinds of small tools for the home workshop; taps, dies, boring bars, screws, studs, nuts and washers, many very useful materials, metal sections, brazing and soldering equipment, rivets and a large selection of blueprints are to be found here. Of special interest are the "Pilot" taps for tapping threads in glands and union nuts, and the "Stay" taps for cutting true threads on the sides of a firebox (the lead part of the tap registers in the spaced hole before the thread begins to cut). Both these taps prevent threads being crossed or cut out of truth, a very useful and desirable feature.

E. Law & Son (Timber) Ltd., 272-274, High Street, Sutton, Surrey. Stand 4.

Exhibits include balsa wood, "Rivarossi" trains (including a working layout) and the Arrowplane glider, which is of unique and futuristic design. This glider can be flown out-of-doors or in a confined space; when thrown in a certain manner, it behaves as a boomerang and

returns to the operator's hand at the conclusion of each flight. Other outstanding features include looping the loop, rolling, bunting, etc.

Percival Marshall & Co. Ltd., 23, Great Queen Street, London, W.C.2. Stands 35 and 36.

These stands seem scarcely to need any introduction to readers of THE MODEL ENGINEER! All over the world, anyone with any interest in the great hobby of model engineering knows the name of Percival Marshall & Co., proprietors of THE MODEL ENGINEER and organisers of the exhibition. THE MODEL ENGINEER has a background of more than 50 years of publishing experience, is known in all quarters of the



A portable transmitter for radio control of models by Electronic Developments Ltd.

globe and is universally recognised as the leading journal in the field of model making. Its companion monthly magazines, *Model Aircraft*, *The Model Railway News* and *Model Ships and Power Boats* cater more specifically for those separate interests, but each carries a similar reputation in its own sphere.

In addition to these periodicals, upwards of 150 books, covering all aspects of model engineering construction and operation, and specimen sheets selected from about 300 different plans and working drawings are set out on these stands, while a cordial welcome awaits all visitors.

Modelcraft Ltd., 77, Grosvenor Road, London, S.W.1. Stand 45.

This firm specialises in constructional model-

making kits, plans, etc. The stand contains a special display of the latest additions to the well-known Modelcraft "Lineside" constructional kits of parts for various "OO" gauge model railway and architectural features; 4-mm. scale building papers; plans; kits and accessories for galleons, clippers, naval and maritime vessels, also the attractive "Micromodels" of locomotives, rolling-stock, lorries, buses and the like.

Multicraft Tools Ltd., 406, Euston Road, London, N.W.1. Stand 53.

The range of all-British tools and hobby kits produced by this firm include the "Multicraft" precision cutter which is shown here. This cutter comprises a handle enclosing four differently shaped blades, which can be securely attached in a few seconds. Other interchangeable blades are available, also chisels, files, etc., to fit the same handle.

Other features are the "Multicraft" Major and Cadet outfits, and the "Multicraft" sanding block.

Showing for the first time is the "Multicraft" Miniplane, which is a high quality woodworkers' plane, in a miniature size, suitable for model making and other amateur crafts.

The Munster Chemical Co., 266, Munster Road, London, S.W.6. Stand 44.

This stand is devoted to demonstrations of "Silvit" silver plating fluid, which can be applied to all metals except aluminium, and its alloys, producing a hard and durable silver deposit which is proof against rust, acids and tarnish.

This preparation requires no special apparatus for its application, and can be applied either to new work or to the restoration of worn chrome, silver or nickel plating, with equally good results.

Myford Engineering Co. Ltd., Neville Works, Beeston, Notts. Stands 23, 24, 25, and 26.

The name of Myford has now become a household word among model engineers, and Myford lathes have been used in the production of a large proportion of the models which will be on show at the Exhibition.

The standard range of metal working and wood working lathes includes the ML7 heavy duty screw cutting lathe, the ML8 woodworking lathe, and the MG9 precision grinder, all of which are displayed and demonstrated.

Other devices include the $4\frac{1}{2}$ in. bench planer and bandsaw unit, for attachment to the ML8 woodworking lathe. The new Super 7 lathe, which is fitted with a high-speed headstock incorporating a friction clutch, a standard ML7 with clutch accessory, and the ML7 lathe completely fitted with equipment for repetition work.

Another special feature is a 50 c.c. two-stroke bicycle power unit, especially designed for construction in the home workshop. An example of this engine in section, motor driven to show the details of its construction, is on view.

John M. Perkins & Smith Ltd., London Road Works, Braunston, near Rugby. Stand 16.

The speciality of this firm is tungsten carbide tipped drills for dealing with hard or refractory materials. They include the Glazemaster drills

for glass drilling, the Concrete Master drills for concrete floors, etc., and Mason Master Rynplugs and plastic wall plugs.

Demonstrations of new methods of drilling building materials such as bricks, stone and concrete with these tools will be given, and the ease with which glass or tiles can be drilled will be of interest to all home mechanics, and handymen.

Popular Mechanics Co., 109, Jermyn Street, London, S.W.1. Stand 54.

The well-known American publication *Popular Mechanics* is familiar to most of our readers, but until comparatively recently, it was difficult to obtain in this country, as supplies were very limited.

The news that it is now available in an English printed and published edition will be welcomed by many readers, and a selection of current and past numbers are available at this stand.

Precision Model Engineering Co., Paradise Street, Liverpool. Stands 11 and 14.

This firm specialises in the manufacture of fittings for steam locomotives and boilers as well as of complete boilers; model racing car bodies are also turned out. Representative tools, equipment and accessories from the firm's aircraft, ships, model railway and tool departments are also displayed. Examples of miniature gear-cutting include a fine antique musical-box which the firm has reconditioned; it is probably unique in that it has a fine organ accompaniment. Recent correspondence has proved that many readers are keenly interested in musical-boxes, so they should not miss seeing this one.

The Quickdraw Co. Ltd., 127, Gunnersbury Avenue, London, W.3. Stand 51B.

This firm exhibits a very ingenious and unusual drawing appliance which very much simplifies the task of making mechanical drawings.

Being compact and entirely portable, it dispenses with the need for the usual tee squares, set squares and other instruments.

It embodies a folding fibre drawing board with a simple means of holding drawing paper, and a parallel motion pantograph with a specially graduated template giving the angles most commonly used in mechanical drawings.

Ripmax Limited, 39, Parkway, Camden Town, London, N.W.1. Stand 41.

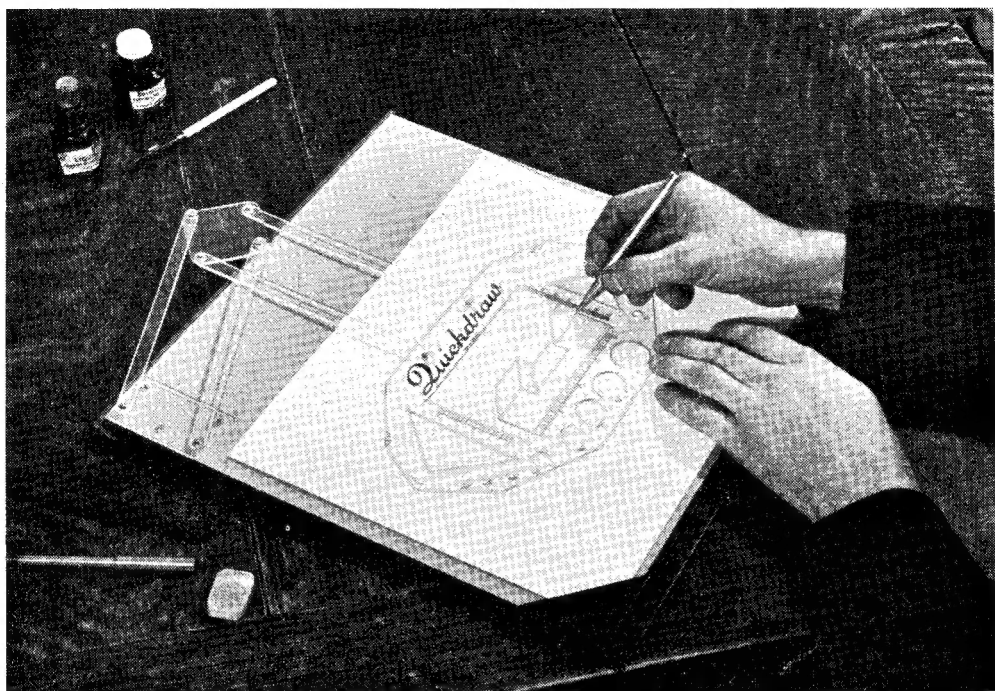
The display on this stand will comprise a full range of kits and accessories by Keilkraft, Veron, Mercury, Frog, Skyleada, etc.; also Allbon, D.C., Elfin, E.D., Frog, and Mills engines.

Radio control equipment by E.D., E.C.C., Flight Control, Ivy, etc., will also be on show, including the new E.C.C. ready-wired transmitter chassis.

Boats are also being featured, the Wavemaster and Veron police launch being shown equipped with radio control. Demonstrations of these boats will take place on the demonstration tank during the Exhibition.

H. Rollet & Co. Ltd., 6, Chesham Place, London, S.W.1. Stand 42.

The supply of essential raw materials for model



The "Quickdraw" appliance in use

engineering has been by no means easy of recent years, and the display of brass, copper, bronze and aluminium alloys by this firm will gladden the hearts of many of our readers.

Included in their display is a scale model showing a section of one of the firm's warehouses, illustrating some of the cutting machinery for dealing with non-ferrous sheets and strips, and also the storage arrangements for the very large range of material stocked.

Donald Ross & Partners Ltd., 1-3, Arlington Road, London, N.W.1. Stand 43.

The main feature of this stand is the "Twinner" portable electric welding and soldering unit suitable for sheet metal and light work.

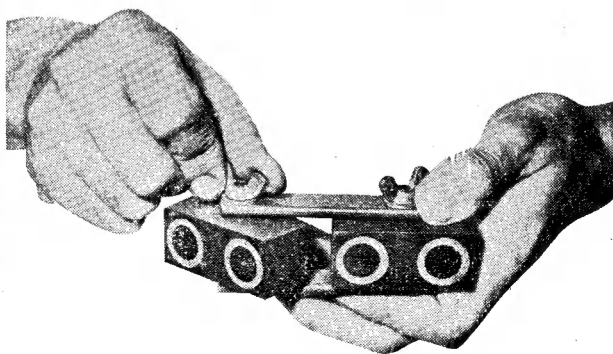
This operates on low voltage produced through the medium of a transformer giving a heavy current output. This current is applied to the work through the medium of a carbon electrode, the resistance of which produces intense heat, which may be controlled to suit the melting-

point of the solder, or the work to be dealt with.

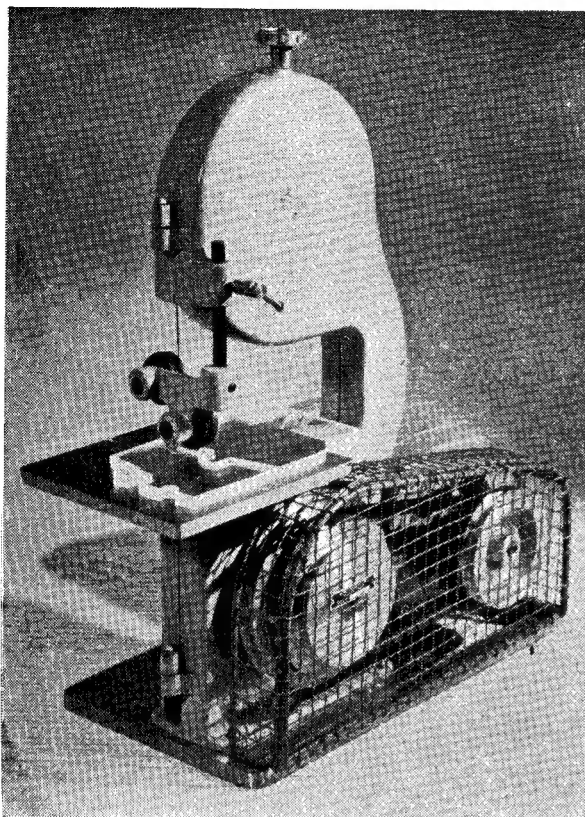
Another item on show is the "Twinner" adjustable magnetic clamp, which provides a very simple means of holding pieces of iron or steel together at any angular relationship to each other while welding, soldering or marking, for these clamps consist of magnetic blocks measuring 2 in. \times 1 in. \times 1 in. connected by a pair of metal straps adjustable to any angle related to each other. By using a number of these, it is possible to deal with the most elaborate set-ups, involving a number of separate pieces, in fabricated structures.

Royal Air Force, Air Ministry Information Division, Parliament Square House, Parliament Street, London, S.W.1. Stands 47 and 48.

An important part of this display consists of models of aircraft made by the prize-winners in the Annual R.A.F. Model Aircraft Association Competition held recently, and also other types of models made by R.A.F. personnel



The "Twinner" universally adjustable magnetic clamping device, by Donald Ross & Partners Ltd.



The Tyler Minor bandsaw machine, by Spiral Saws Ltd.

in their spare time. The value of model engineering, both as a pastime and as an aid to training and education, is fully recognised in the R.A.F. and is given every encouragement.

Good opportunities are offered to young men with spirit and initiative in the R.A.F., and in view of the present extension of the services, the prospects for promotion are better than ever. There are also many technical jobs open either to direct entrants, or through the R.A.F. apprenticeship scheme. Full details of these opportunities can be obtained at the stand.

Royal Navy, Chief of Naval Information, Admiralty, S.W.1. Stands 8 and 9.

At this stand also, a display of models made by officers and ratings of the Home Commands of the Royal Navy can be seen. These models constitute the winning entries in preliminary heats in a model making competition held recently throughout naval establishments. They represent all branches of model making, and also examples of the intricate mechanical work carried out by craftsman apprentices in naval establishments.

Rozalex Limited, 10, Norfolk Street, Manchester, 2. Stand 2.

Most engineers are familiar with the preparations of this firm, which are very extensively used

industrially at the present time as a means of facilitating cleaning of the hands in cases where dirt or grease is encountered.

Rozalex preparations enable the engineer to clean the hands thoroughly without the use of solvents or abrasives, all that is required being a simple wash with soap and water.

S.C. Metal Sale & Servicing Co., Token Yard, Putney High Street, London, S.W.15. Stand 18.

Surface finishing preparations for metals are the speciality of this firm including "Besschrome" silver and chromium plating materials, and compounds for colouring metals, and demonstrations of these are given on this stand.

Dick Simmonds & Co., 5, South Road, Erith, Kent. Stand 18.

As suppliers of drawings, castings, materials, fittings and boilers for a long list of locomotives designed by "L.B.S.C.," as well as for their own 5-in. gauge 0-4-0 tank locomotive *Ajax*, Dick Simmonds & Co. have been, for many years, well to the fore. A large selection of these products can be inspected at this stand. For those of our visitors who favour the construction of an imposing 2-in. scale showman's road locomotive, we would call attention to the *Thetford Town*, designed by R. H. Clark from the original Burrell drawings. Dick Simmonds & Co. supply castings, materials and drawings for this engine.

Spiral Saws Ltd., 8B, Bedford Avenue, Trading Estate, Slough, Bucks. Stand 33.

The spiral saw blades which are featured at this stand represent an entirely new development in cutting tools. They consist of a high tensile steel wire having a spiral cutting edge projecting from the surface, and thus forming a saw with cutting edges round its complete circumference, so that it will cut in any direction.

These blades are made in a form which can be fitted to an ordinary hacksaw frame, using special adaptors, or to small coping saw frames, also mechanical jig saws, or in the form of a continuous blade for use in a bandsaw machine for metal cutting.

Demonstrations are given both of hand and machine applications of the blade, which will cut any material, including wood, metal, plastics, rubber and even glass.

S. Tyzack & Son Ltd., 341-345, Old Street, London, E.C.1. Stand 29.

This old-established firm of dealers in tools and equipment are featuring their usual comprehensive display of tools especially suited to model making and light industries, including the well-known Zyto lathes and other machine tools, together with a wide range of accessories.

Practical demonstrations of the "Zyto" back-geared, screwcutting lathe are given on the stand.

Victa Engineering Co., Thicket Corner, Maidenhead, Berks. Stands 6 and 7.

Machine tools and equipment for both amateur and professional engineers are featured on this stand, including the Hobson $3\frac{1}{2}$ in. and $5\frac{1}{2}$ in. all-geared head screw cutting lathes.

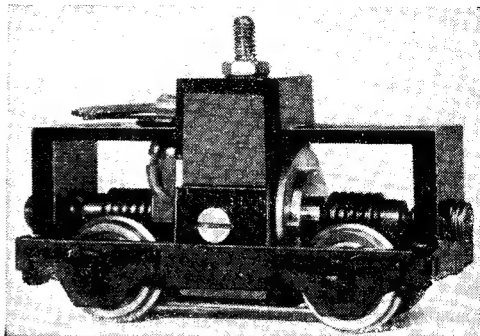
These machines are fitted with totally-enclosed headstocks, incorporating change-speed gearing, and oil-bath lubricated. These have all machine-cut gears, representing a departure from the usual cone-pulley belt-driven types of lathes.

Other machines include the Eagle surface-grinding machine, which has an 18 in. \times 16 in. table, and the Warwick all-geared bench type milling machine.

Walkers & Holtzapffel Ltd., 61, Baker Street, London, W.1. Stand 3.

Specialists in model railway equipment for gauges "OO" and "O," this firm is displaying a comprehensive selection of its products, covering all the needs of the model railway enthusiast. "Romford" mechanisms, motor bogies and motor units are particular specialities interesting to enthusiasts who build their own motive power units. The "Romford" "OO" gauge motor coach bogie is a precision unit for installing in models of electric motor coaches and railcars; it is fitted with an accurately balanced flywheel with power transmission to all wheels. Its slow-running, smooth starting and gradual stopping are most satisfying; yet it has plenty of power and speed.

The "Romford" Series V motor unit for "OO" gauge is also fitted with flywheel drive and gives a most realistic performance to any locomotive to which it is fitted. It is equipped



A speciality of Walkers & Holtzapffel. The Romford motor-coach bogie for "OO" gauge. Fitted with balanced flywheel and power transmission to all wheels

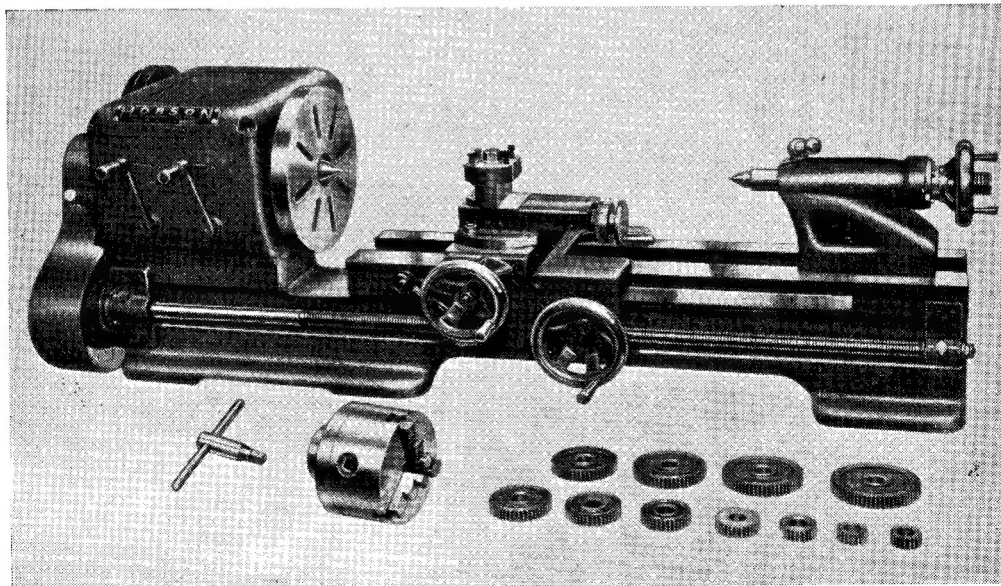
with a very powerful Alcomax magnet, hardened armature shaft with ground pin-points running in ball thrust races, and a 30-to-1 worm gear. It is wound for 12 volt d.c.

Showcases and Sample Display Stands

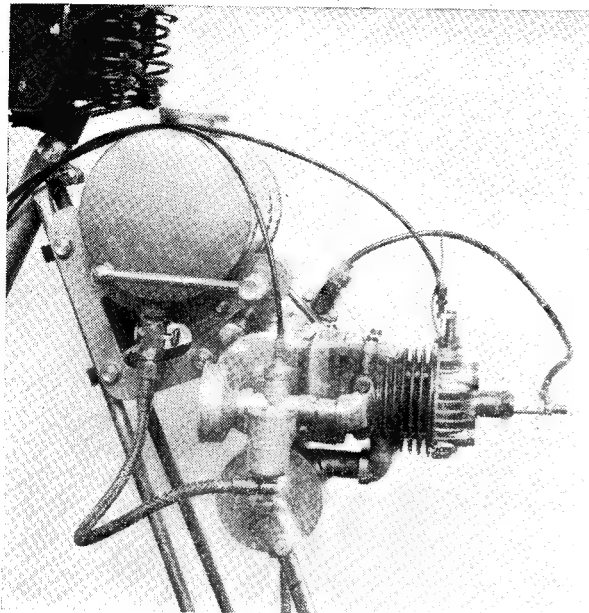
Braid Bros., 50, Birchwood Avenue, Hackbridge, Surrey. Showcase X and Y.

Castings and materials for the construction of the "Busy Bee" 50 c.c. auxiliary engine, as described in THE MODEL ENGINEER, constitute one of the main features of this display.

Several improvements have been made in the castings, which include die castings for some of



The Hobson geared head $3\frac{1}{2}$ -in. lathe, by Victa Engineering Co. Ltd.



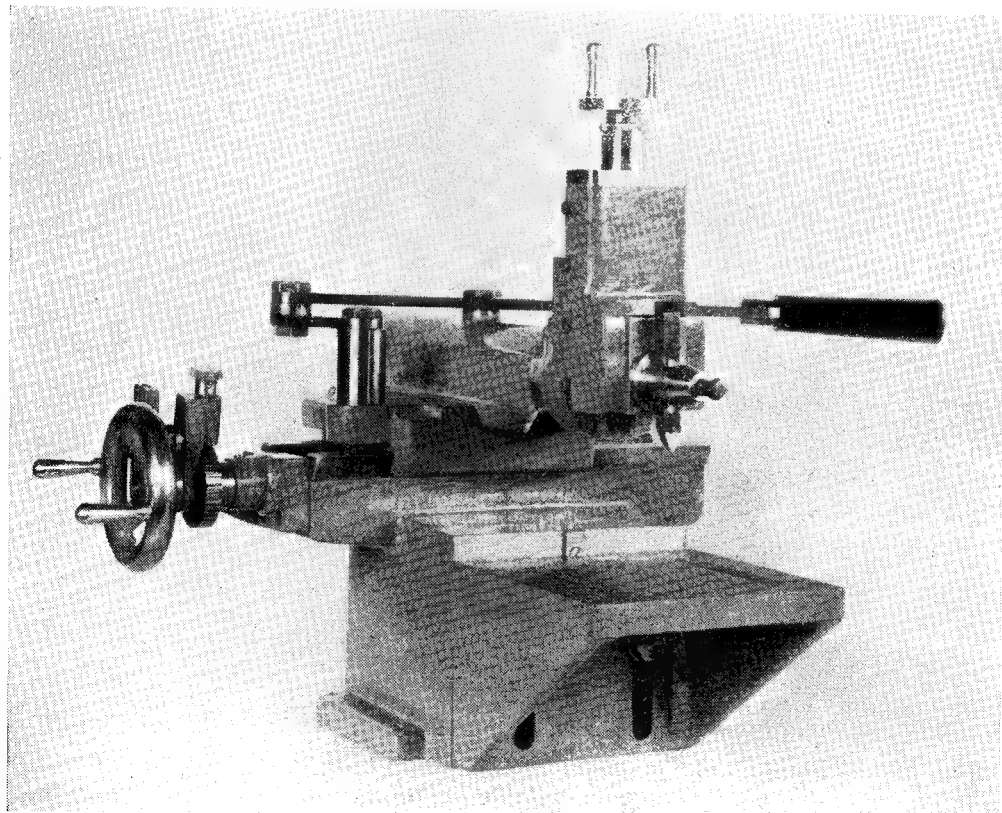
The "Busy Bee" auxiliary engine by Braid Bros.

the important parts, such as the cylinder-head, and also precision alloy steel castings for the construction of the crankshaft. Aluminium cylinders, with alloy steel liners, are offered as alternatives to solid cast-iron cylinders. The Wico-Pacy "Bantamag" and the "Amal" carburettor, as specified for this engine, are also shown.

Another important item is a complete range of components for the construction of domestic refrigerators, including "Silent" absorption units for use with electricity, gas, bottled gas, or paraffin, mechanically driven units, and separate components such as compressors, condensers, thermostats, expansion valves, and controls, also fittings for all types of refrigerators, and insulating material; together with constructional prints and instructions to enable the amateur to build a refrigerator with the minimum of expense.

E. W. Cowell, 7A, Sydney Road, Watford, Herts. Sample Display Stand.

Of recent years, Cowell products have achieved a well-deserved popularity



The "Cowell" 6-in. hand shaping machine

among model engineers and other users of small machine tools for their conscientious design and workmanship.

The display this year includes a $\frac{3}{8}$ in. bench drilling machine for belt drive, and also a bench drilling machine for motor drive, a 6 in. hand-shaping machine, a $2\frac{1}{2}$ in. plain lathe designed to take collet chucks, also sets of machined castings for constructing various tools and fixtures.

W. H. Haselgrove, 1, Queensway, Petts Wood, Kent. Sample Display Stand.

The castings produced by Mr. Haselgrove in iron and non-ferrous alloys have long been known

Z.N. Motors Ltd., 904, Harrow Road, Willesden, London, N.W.10. Showcase site.

The range of high-grade components and accessories for model racing cars and model aircraft, for which this firm is well known, are featured in this exhibit, and includes complete kits for the construction of 5 c.c. and 2.5 c.c. racing motor cars.

The Web Model Fitting Co., 204, High Road, Wood Green, London, N.22. Sample Display Stand.

Shipmodellers, whatever branch of the craft they may specialise in, will be interested in the



A selection of Web ship model fittings

to model engineers, and have a high reputation for quality and accuracy.

This display will give constructors an opportunity of inspecting these castings, which include sets for the construction of the "Duplex" back tool post and hacksaw machine, and the "M.E." swivelling vice, drilling machine, bench grinder and jigsaw attachment.

The Turpin universal dividing head, and various other components for constructing locomotives and other models are also shown.

Imperial Chemical Industries Ltd., Plastics Divn., Welwyn Garden City, Herts. Showcase.

The application of plastic materials to model engineering and ornamental turning has opened entirely new possibilities for the production of attractive and useful articles by fabrication, machining, or moulding.

This exhibit features some of the most popular plastic materials including perspex acrylic sheet and rod in various colours, "Tensol" cements, and perspex polishes, etc.

samples exhibited by the Web Model Fitting Co. This firm makes an extremely wide range of ships' fittings, and as the design and quality of their manufactures is of a very high standard, visitors should give themselves time to study the samples carefully. They include fittings for model yachts, ships—sail and steam—liners, naval vessels, in short, fittings for ships of all types and sizes. The steam fittings will interest the power boat man, as will also the engines and boilers supplied by this firm. They publish a most valuable catalogue, price 2s. 6d.

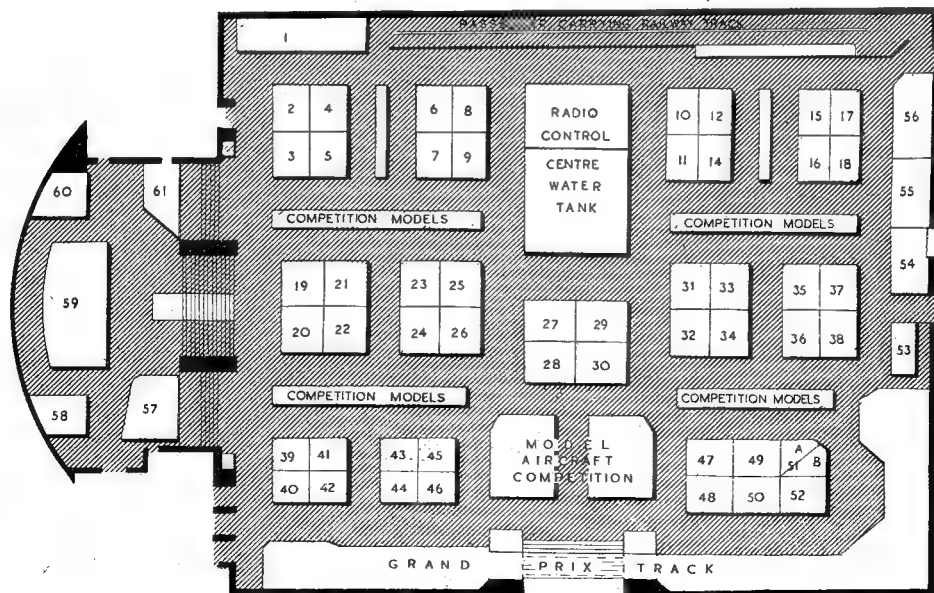
On one of the Showcase sites there is a complete set of castings by **W. K. Waugh**, 31, Hillfoot Drive, Bearsden, Glasgow, for "L.B.S.C.'s" $3\frac{1}{2}$ -in. gauge British Railways Class "7" 4-6-2 locomotive, *Britannia*; also examples of "OO" gauge railway landscape and lineside features and the Dawes Dingle fabric-printing outfit by **Smeaton-Stuart & Fox**, 41, Ilsham Road, Wellswood, Torquay, Devon.



THE MODEL
ENGINEER
EXHIBITION

ALPHABETICAL LIST OF EXHIBITORS AND GUIDE TO STANDS

	Stand Nos.		Stand Nos.
Air Ministry Information Division	... 47 & 48	Law & Son	... 4
Burnerd & Co. Ltd.	... 5	Lyons & Co. Ltd.	... 52
Buck & Ryan Ltd.	... 19 & 20	Myford Engineering Co. Ltd.	... 23, 24, 25 & 26
Bassett-Lowke Ltd.	... 22	Munster Chemical Co.	... 44
British Model Aircraft Mfg. Co. Ltd.	... 28	Modelcraft Ltd.	... 45
Black & Decker Ltd.	... 34	Metal Sale & Servicing Co.	... 18
Burnett Machine Tool Co. Ltd.	... 49		
Busibind Ltd.	... 51A	Precision Model Engineering Co.	... 11 & 14
Chief of Naval Information	... 8 & 9	Perkins & Smith Ltd.	... 16
Chloride Batteries Limited	... 27	Phillips Omnipool Ltd.	... 53
Deaves, R. J.	... 15	Popular Mechanics Company	... 54
Dick Simmonds	... 17	Percival Marshall & Co. Ltd.	... 35 & 36
Electronic Developments (Surrey) Ltd.	30	Rozaléx Limited	... 2
Fling Ltd.	... 46	Rollet & Co. Ltd.	... 42
Graham Farish Ltd.	... 21	Ross & Partners Ltd.	... 43
Hambling's	... 39	Ripmax Ltd.	... 41
Heller & Sons (Engineers) Ltd.	... 50	Spiral Saws Limited	... 33
Iliffe & Sons Limited	... 32	Tyzack & Son Ltd.	... 29
Kennion Bros. (Hertford) Ltd.	... 31	The Quickdraw Co. Ltd.	... 51B
		Victa Engineering Co.	... 6 & 7
		Walkers & Holtzapffel Ltd.	... 3



"L.B.S.C.'s" Exhibition Lobby Chat

More Reminiscences

AT the time of writing, I've just had the tip from "he-who-must-be-obeyed" (apologies to Ayesha, of Rider Haggard's story!) that something appropriate to the Exhibition number, would be most suitable for this week's notes. Well, being always ready to oblige, here goes. I have already recounted some incidents, and passed ■ few observations on THE MODEL

to operate ■ passenger-carrying track; something which, at that time, had never been done at any exhibition over that side. The trouble was, to find little locomotives capable of operating it and hauling living loads. There were several steam locomotives to be shown at the exhibition; and whilst their builders were enthusiastic ■ to what these engines *could* do, they were un-



Mrs. Barlow (looking out of cab) and the Barlowettes (on the coal—just like kids!) visit dad's R.H. & D.R. engine

ENGINEER Exhibitions previous to 1935, when I ceased to attend them; so by way of variety, let's look back for a matter of twenty-two years or so, and recall some happenings at an exhibition which then took place in the land of dollars and sense. Eh? Yes, that last word is spelt correctly; I can't imagine our transatlantic cousins putting up with ■ mass of crazy restrictions and a horde of bureaucrats—nuff sed!

Soon after the New York S.M.E. was formed, your humble servant was made an honorary life member; an honour which has since been bestowed on me by other societies in U.S.A. and Canada, and for which I am duly grateful. Therefore, when the club organised an exhibition, and I was in the country, it was only natural that I should be invited to help keep the pot boiling. It was proposed, among other things

commonly shy of putting them on the track and letting them do it. I remember one in particular, ■ 2½-in. gauge New York Central 4-6-2 which, the builder claimed, had ■ tractive effort of 17 lb.—on paper, not on the rails!

I was staying with ■ friend, the late Calvert Holt, at the time, and we had put up ■ 120-ft. 2½-in. gauge line on his "lot," on which old *Ayesha* (she was with me, "naturalised" with a bell and headlight) performed in her usual manner, burning American soft steam coal, and putting up ■ smoke barrage all over the landscape. The tubes wanted sweeping after every run! Holt had ■ large amount of flat-bottomed brass rail in stock, as he was going to lay ■ quarter-mile ground level 3½-in. gauge line around his bit of real estate; ■ nobby bit of civil engineering, involving the construction,

among other things, of three bridges over a stream which meandered through the grounds; maybe I'll tell the tale of this, on some future occasion. Anyway, he said we had better show them how to do it; and so a portable track was rigged up, with three rails, for 2½-in. and 1¾-in. gauge engines, nothing larger being available to run. This was erected in the building, in which the show was being held; and as that building happened to be in the "skyscraper" section of New York City, and had umpteen stories or floors, you can bet that plenty of precaution had to be taken against fire.

Safety First!

American steam coal makes plenty of smoke, as mentioned above. Anthracite was available, as it is used extensively over there for central-heating boilers; at least, it was at that time (we used it at the little cottage which I occupied, on Holt's ground) but it was different from the Welsh or Scottish kind, and covered the firebars of a little engine with a stony deposit after a very short time. We couldn't use the soft steam coal, or all the visitors would have been choked or gassed by the fog; so the only thing to do, was to burn Ford briquettes. These were made from processed charcoal, and burnt without smoke or residue, making bags of steam, and the only deposit was a fine dusty ash which fell through the bars; but oh, boy—the sparks! The engine had only to slip a couple of turns, and there was a shower of "golden rain." To avoid any chance of fire due to inadvertent spark-throwing, we rigged up a "smoke-board" the full length of the track, some 100 ft. or so. This was composed of long pieces of asbestos millboard about 2 ft. wide, suspended from the roof by wires. We also well covered the floor at the end of the track, where we got up steam, and did the various shed duties, so reckoned, we were pretty safe.

Astonishing the Natives!

The opening day duly arrived, and early in the evening, I got up steam on old *Ayesha*, interesting a crowd of New Yorkers—boys and girls of all ages!—who had never seen a wee British locomotive before; and there were amused smiles when they asked where was the train, and I told them I was the train. We had fixed up an eight-wheel passenger car, on two ball-bearing bogies, which would accommodate two adults or three youngsters. The rails being new, were oval on top, with practically knife-edge contact between railhead and wheel tread; so we had previously spread a couple of packets of bird sand (the only fine sand available) over the railheads, for the full length of the line, sat on the car, and rolled the sand in as much as possible, to minimise any slipping, and prevent spark-throwing.

Well, old *Ayesha* duly began to sizzle at the safety-valve, so I ran her up and down a couple of trips, to let her warm up. Then I made up the fire with some of the broken-up briquettes fuel, sat on the car, and opened the regulator.

I'll never forget in all my life—what's left of it, that is—the look of absolute astonishment on the faces of the spectators, when the little engine

started off with no apparent effort, and ran steadily down the track. I didn't give her too much throttle, on account of the spark-throwing, and she behaved herself like a good girl. The club members came hurrying over, and were nearly as amazed as the lay folk, especially the owner of the alleged 17 lb.-tractive-effort (?) job. Then I started taking the kids for a trip, two at a time; and after that, club members and other adults. Naturally, the club members wanted to handle the throttle for themselves; so after showing them how to drive her, so as to keep the fire in the box, I let them take over. Then several engineers (they call drivers "engineers" over the big pond) from the New York Central, New Haven, Pennsylvania and other lines, took a turn at running the tiny British "Atlantic," and they couldn't make out where the power came from!

The Fire Inspector Takes a Hand

Although these big buildings are well protected by automatic sprinklers and other fire-fighting equipment, naturally we didn't want any trouble; and everybody who drove the engine, realising this, carefully followed my instructions about keeping the sparks down. As some more kids were clamouring for a ride, I took the engine over again, and had just got nicely going, when in came the fire inspector. He stood watching the locomotive doing her stuff, with wide-open eyes, and when I had finally disposed of my small passengers, came over and started a friendly chat, asking various questions about the engine, and how she worked. Finally, he said "I've always wanted to be a locomotive engineer—do you suppose I might try to run that cute little tea-kettle?" I said "Sure, go right ahead, but sit quite still on the gondola, don't bear your hands on the tender, and be careful not to give her too much throttle." He said "O.K., I'll be mighty careful," and took his seat. I popped a bit more on the fire, saw that the water was well up the glass, and said with a grin. "All aboard—highball!"

He opened the regulator very gingerly, and *Ayesha* moved off; but our friend found that it was rather a different matter, riding the little car with his feet off the ground, than sitting stationary on it with his feet down, and he wobbled about a bit. Then he reached for the regulator handle, to give her more steam—and you can guess what happened! What with the handle being rather too warm for his sensitive fingers, and nearly losing his balance when he let go of the car, he pushed the handle right over. *Ayesha* immediately lost her feet, the driving wheels flew around like a buzz-saw, and a terrific stream of sparks and burning lumps of briquette shot from the chimney, hit the smokeboard, and cascaded all around the engine, the inspector, and myself, to the great delight of the kids and the alarm of the adult spectators. I shut off quick and stopped the firework display; telling the amateur throttle-jerker that he must not open up more than half-way; and he made another attempt. Anyway, to cut a long story short, after about three minutes, the cheerful merchant who was supposed to make certain that nobody did anything to cause a fire, had

distributed enough incendiary bombs to set half the New York skyscrapers alight! Suddenly he realised who he was, and what he was there for; and jumping off the car, said with a large-sized grin, "Say, I guess I'll be back to make my inspection when you boys have done running!" and that was the last we saw of him.

the six-coupled wheels holding the road better than old *Ayesha's* four. This "astonished the natives" even more than my old girl, as she was making steam with only four alcohol (as methylated spirit is known over there) wicks; and this led to an argument between two "full-size" drivers. One of them said it was impossible



"Driver Joys" of the future are keenly interested in Mr. D. Holt's "Doris"

False Alarm!

My old friend Joe Lozier—now, alas! in the land beyond Jordan—brought up the gauge "1" Pacific which I had built for him some years before, when these notes first started. She was the first locomotive to be described as a "serial," and got the nickname of the "Ford" Pacific because, like the famous Detroit "Tin Lizzies," she was simple, cheap, easily built, and reliable. Joe knew, of course, that she could do a spot of passenger hauling, because he had ridden behind her himself, on my old line at Norbury, when he was in England on a visit, and took her back with him. Incidentally, when the Customs officer saw her, he asked Joe why the heck he wanted to buy a thing like that in England, when he could get a better one at Schultz's toy store for five dollars; and added there wasn't any duty, because whatever he paid for it, he'd been robbed anyway. As we had laid a 1½-in. gauge third rail, Joe wanted to run the "Lizzie," but he was scared stiff of driving her himself. He was a very nervous man, although well built and weighing well over 200 lb.; and remembering his antics on my 2½-in. gauge car at Norbury (the one with the roller-skate wheels) wouldn't chance it in public. I soon settled that question, for on the second evening I steamed up the "Lizzie," and she not only hauled my weight easily, but a kiddy as well,

for a little thing like that, to steam continuously; and the only way she kept pressure, was because I shut off steam just over half way along the track, to make an easy stop for reversing. The other one said he wasn't so sure, as the safety-valve popped too soon after shutting off, for her to be short of steam; so they decided to ask me. When I told them she would maintain 80 lb. as long as there was water in the boiler and alcohol in the tank, the unbeliever just laughed and loosed off the old catch-phrase "Well, I guess I'm from Missouri—show me!"

All Eagerness

Your humble servant didn't need a second challenge! In the annexe was a big table with a gauge "1" circle on it about 15 ft. diameter, on which sundry folk had been demonstrating clockwork and electric gadgets hauling a few cars. I went in and explained matters, saying that I wanted to give the "Lizzie" a run of half-an-hour at least, to show that she would steam continuously; could I use the circle, and would they please lend me some heavy cars. The club members were all eagerness, and cleared the track, then went around the stands and collected ten of the best cars they could find; real hefty hand-built things, of "scale" length. When I said "thank you very much" and proceeded to put the whole lot on the track and

couple them up—oh boy! the glad tidings were soon spread, and there was a nobby crowd when I had finished oiling around, got up steam, and coupled on. Joe Lozier naturally "had a front seat," and became very excited. Well, off went the "Lizzie," slowly at first, then gathered speed as she warmed up, and presently was doing a "scale ninety," with occasional pops from the safety-valve; and the rattle and clatter the train kicked up as it raced around over the rail joints, was just nobody's business. Joe got so steamed up that he couldn't contain himself any longer at the "ringside," so he got on to the table and stood in the middle of the circle. Now comes the comic interlude! Joe as I mentioned above, was very nervous, and this was well known to the club members; and the funny man of the club, thought that this was the time to scare Joe out of his pants, so he got a big brown-paper bag, and unnoticed by Joe, crawled underneath the table, blew out the bag, and hit it with his fist—BANG!! Poor Joe thought the locomotive boiler had blown up, was too scared to look, but just made one flying leap off the table, then crashed through the spectators and ran clean out of the premises! Luckily, he missed the little train, which continued merrily on its way; and when the laughter had subsided, the spectators settled down to watch it again. Thirty-seven minutes after the start, the safety-valve blew off violently for several laps, and then the train slowed down, and finally stopped, with all the fuel and water used up. The lads and lassies of the village gave me a rousing cheer, and the unbelieving engineer shook hands and said that after seeing such a demonstration, he reckoned that whatever I said about the engine, was certainly gospel.

Puzzled Engineer

I took the gauge "O" *Sir Morris de Cowley* along, to show the club members, much to their interest, and left it on their stand for a while, where it soon attracted the attention of some of the full-size fraternity. There were plenty of them at the exhibition, and they showed much interest in the small locomotives on the stands, even though the engines weren't running; my old *Ayesha* did all the passenger-hauling, except for the demonstration running of the "Lizzie." An old Pennsy engineer wanted to have a close look at the wee "O"-gauge, so I picked it up off the stand and handed it to him. He carefully examined it all over, and was amused because the steam gauge was lying on the footplate (the cab is too small for the gauge to be put in the right position) remarking, "Say, your engineer could have put a cushion on that, and used it for a seatbox, but it'd be just too bad having to get up every time he wanted to see if the fireman was keeping her hot." Then he said, "Might I take a peek in the front end?" I replied "Sure," and opened the smokebox door for him. There was plenty of soot and ash in the smokebox, as I had been running the engine at Holt's place on the soft American steam coal, and hadn't cleaned her out before taking her up to the show. The old engineer held the locomotive under one of the lamps on the stand,

to get a good light in the smokebox, and stared into it for quite two minutes; then he turned to me, and with an expression on his face that was "worth a guinea a box" as we used to say at school, he remarked in a very awed voice, "Say, boy, how the hell did you do your plumbing?"

Epilogue

I could relate a few more incidents, but space is short; however, I'd like to record that there was a "something" about that little show that wasn't present in any other exhibition or club meeting that I ever attended in days gone by. Folk spoke to one another though they were all lifelong friends. I got far more "limelight" than I wanted; there was a reason (and still is) why I don't court publicity—eh? Oh, yes, they have my photograph at Scotland Yard! A picture of Curly running the little engine with a load, appeared in the New York newspapers and a film company promptly made an offer to take a film of me running the engine on the track at Holt's place, and doing other things, saying they could write a good story around it. Truth is ever stranger than fiction, I could have given them a real starter; but they didn't know that! On the last day of the show, a quiet-spoken man came along and had a chinwag, and said that he had a little railway; would I care to see it, and run his engines? I hesitated, being shy of visiting strangers (still am!) but he was persistent; asked if I had a car, and when I said I hadn't one as yet, said O.K., come by train and he would send a car to meet me at the station, giving the name of it. He was just turning to go, when I said that he hadn't given me his name; he promptly remedied that omission, and I nearly sank through the floor at hearing the moniker of one of the most wealthy and famous men in U.S.A. Not the slightest sign of the swank and snobbery you usually find in other countries! Well, I took my courage in both hands, and went to visit the railway. Some adventures and experiences I had on it, might form the basis of another lobby chat.

Set Guessing

Speaking of limelight and publicity, it seems a paradox that I don't entertain strangers on my little railway, yet tens of thousands have seen it from passing trains on the four-track main line beside which it is located. Ninety-nine per cent. of the passengers wouldn't take a second look, were it not for the full-sized working signal, which sets them guessing. Correspondents who ride in the trains, tell me that they overhear various arguments and conjectures as to the why-and-wherefore of the little line, the prevailing opinion being that "it must be something to do with British Railways." A reporter on the staff of a popular Sunday newspaper, saw me driving a locomotive, told his editor, and I promptly received telegraphed and telephoned requests for the full story, whilst they wanted to send their cameraman along to take photographs of the locomotives at work. They were astonished when I said that no publicity was required!

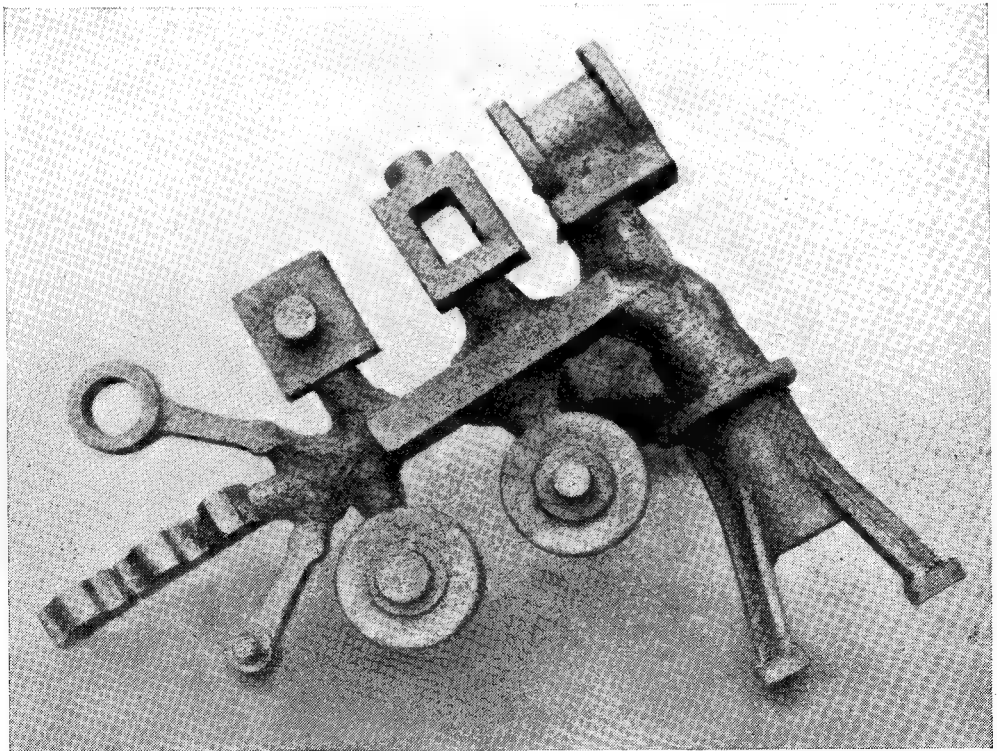
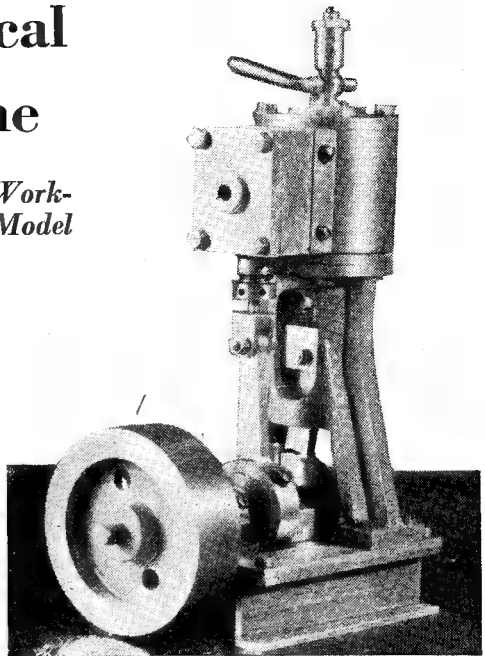
A Small Vertical Marine Engine

For Production in a School Workshop or for the Novice in Model Engineering

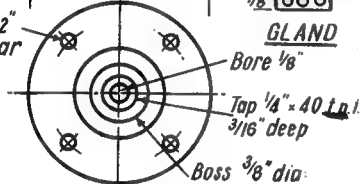
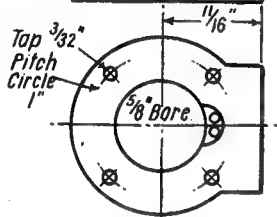
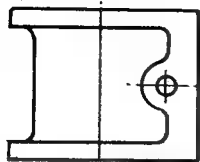
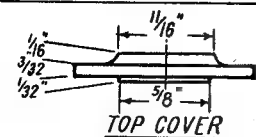
by A. Austin Gray

THE whole object of the design of this engine was to give the boys of Geelong College, Australia, an engine to build that was as simple as possible, using the minimum of thread sizes, etc., and yet to incorporate "good engineering practice."

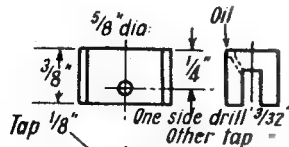
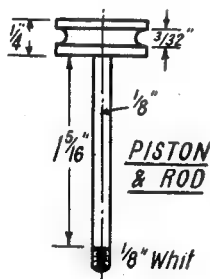
As the time each boy could get on the machine tools was very limited, a box of jigs and template was made; this also gave the younger boys a better chance of producing a satisfactory model.



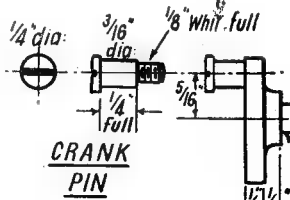
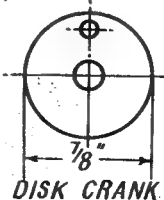
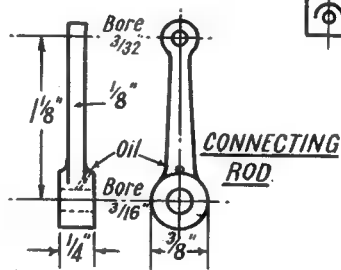
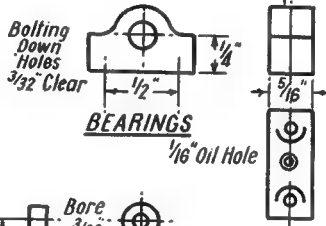
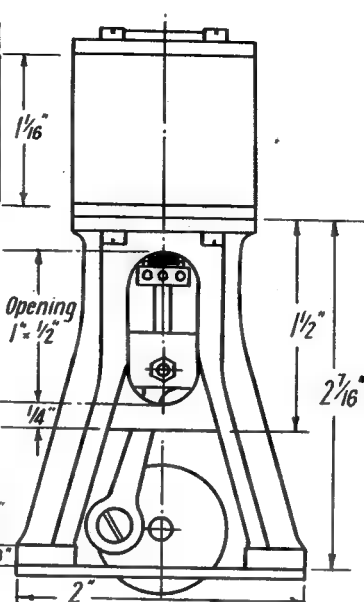
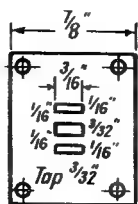
The model marine engine castings as they come from the sand



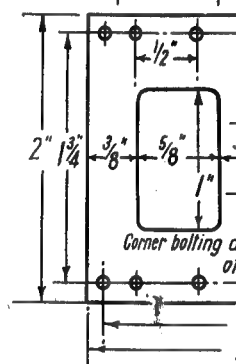
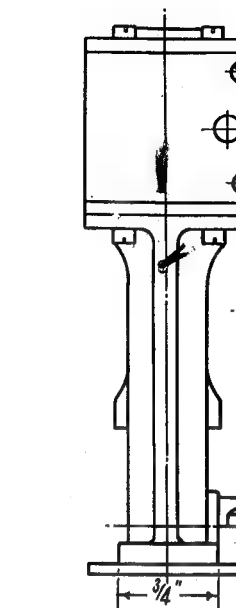
BOTTOM COVER



CROSS HEAD

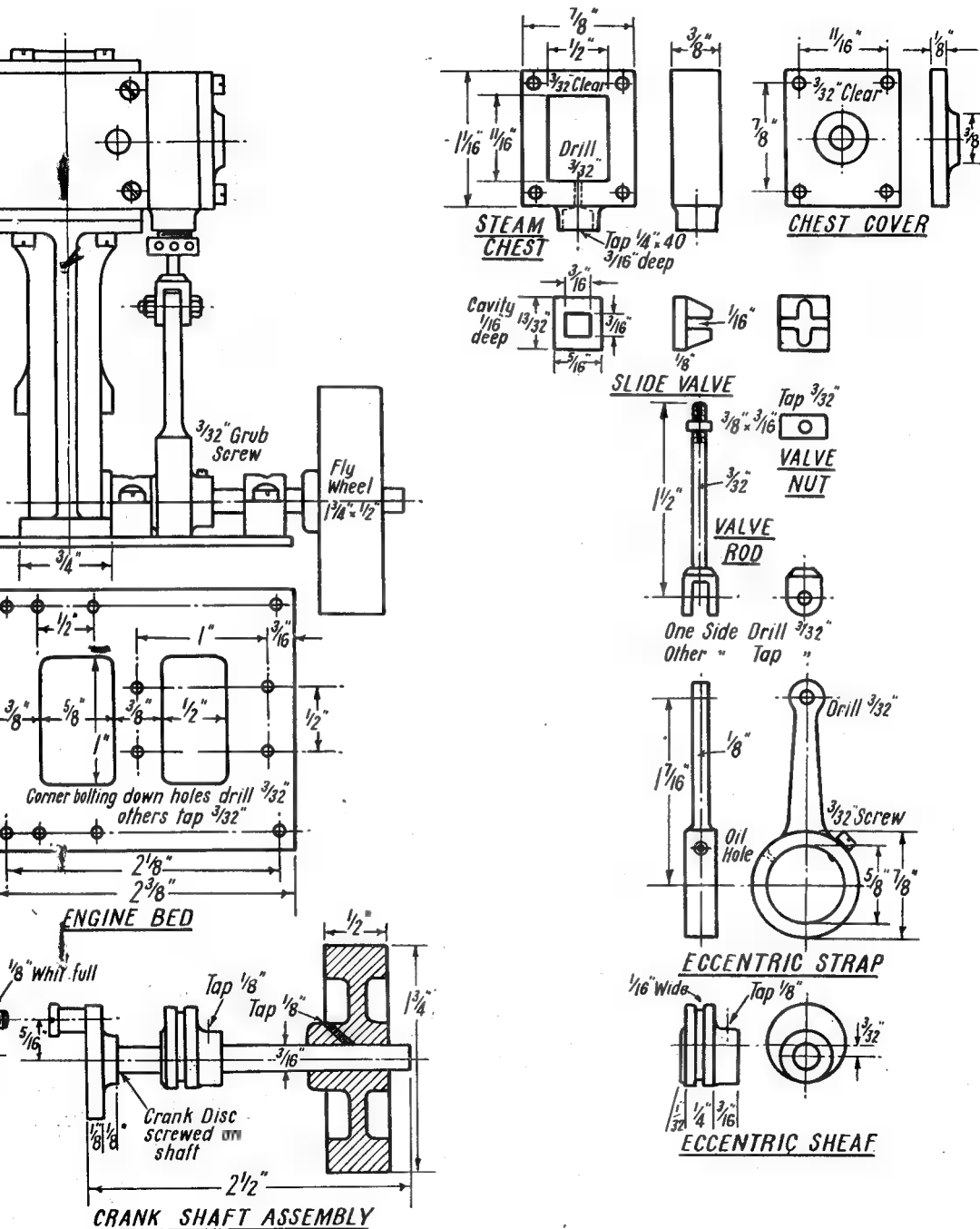


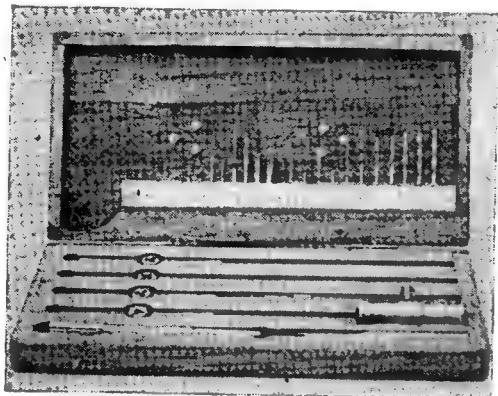
CRANK PIN



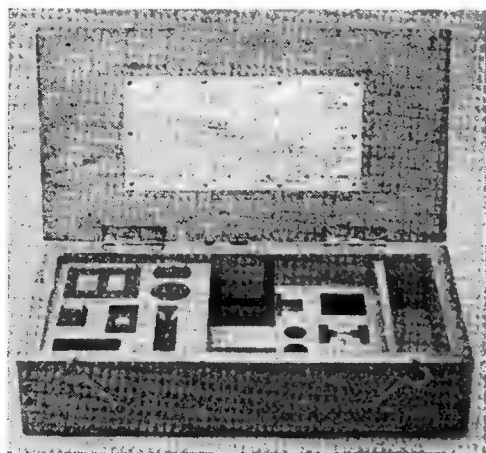
ENGINE

Detail drawings of the simple vertical marine engine

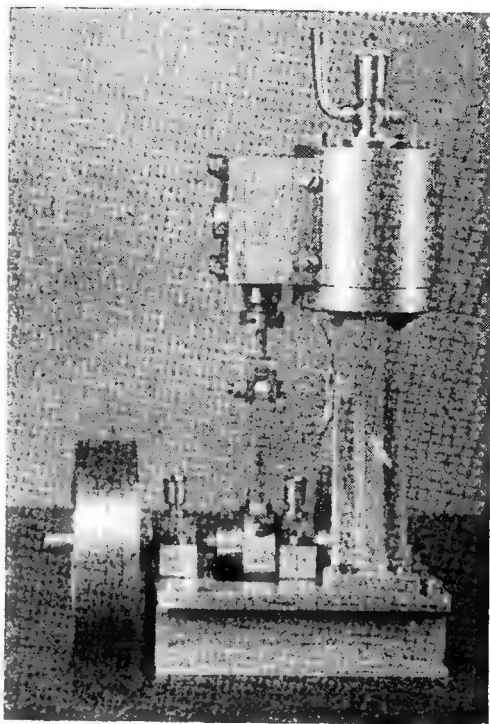




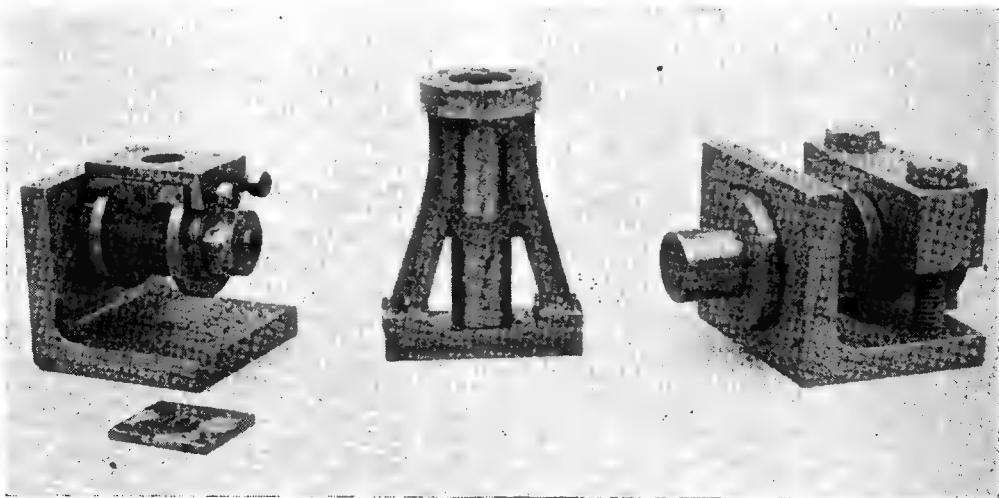
The box of tools



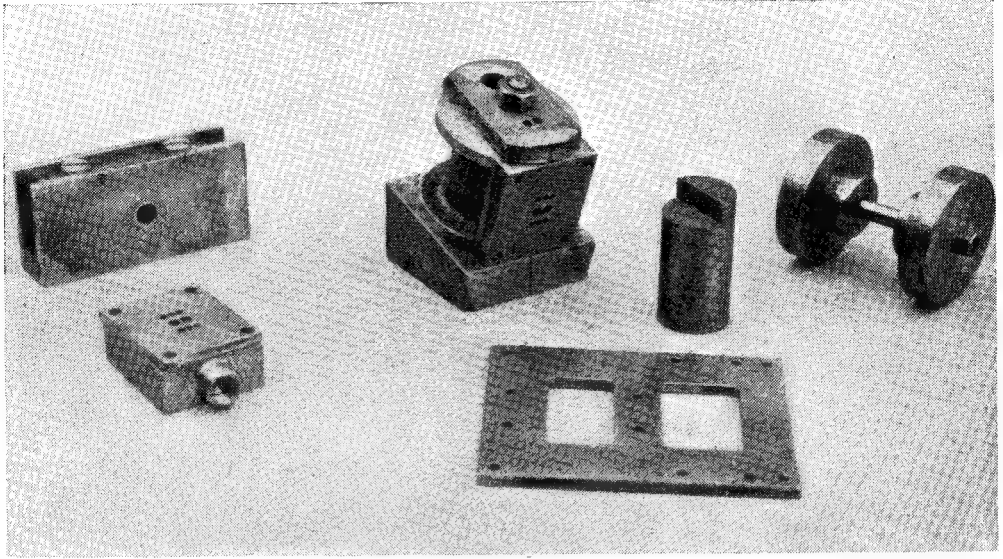
The jig box empty



There was nothing unusual about the sheet of elevations, plans and details, but instead of drawing the parts arranged for the benefit of saving paper only, they were projected right and left from the central engine elevations and down each side of the sheet. Likewise, other parts were drawn projected below the elevations. This makes reading easier and reduces the chance of errors both in design and machining.



Photograph No. 1 of the jigs

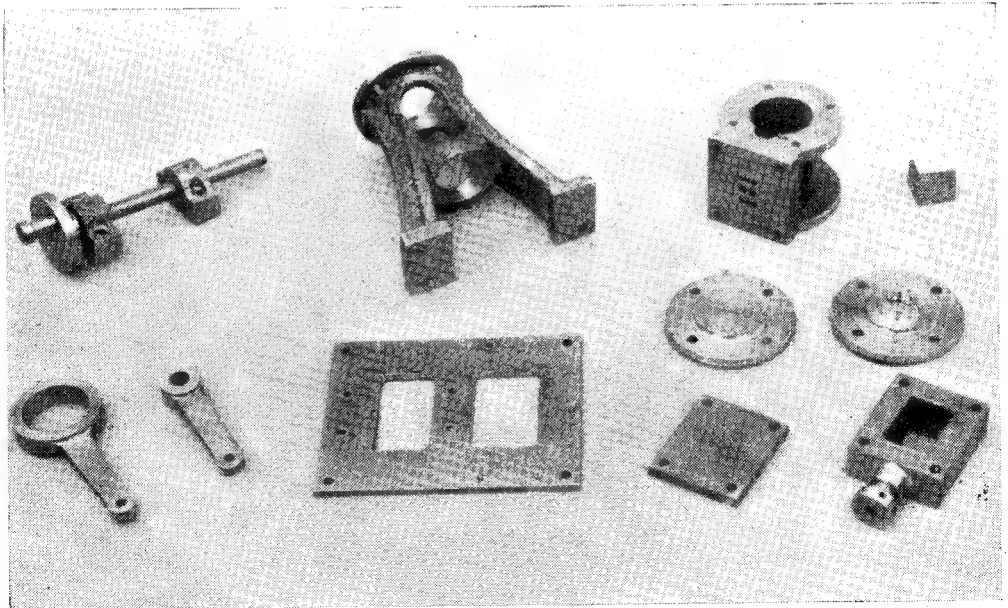


Photograph No. 2 of the jigs

The patterns were quite simple, the only "splits" being for the cylinder and the standard. Both these castings were cast solid with no cores, as it was thought that a little extra work was preferable to the possibility of encountering "blows." All castings are in bronze with the exception of the flywheel, which is in cast-iron.

The tool box contains all the cutting tools

required to build the model. In the lid are two of each of the necessary drills and taps. The block below the drills is faced with a strip of hardened steel to act as a gauge; the drill and tap sizes are marked along the face of the rack, also information as to the various drills' uses, such as clearing, tapping, etc. The box contains stocks and dies, boring bars, tap wrenches and reamers.



A set of machined parts

The jig box was made which has ■ set place for everything and is fully shadow boarded, as the photograph of the empty box shows. On the lid of the box is ■ list of the names of the various pieces.

In the first photograph of the jigs the cylinder boring angle-plate is shown on the right and is used for boring the cylinder after the port face has been machined. This jig is merely an angle-plate with boss at correct height for lathe chuck and "V" clamping bar for the cylinder casting. The port face drilling stand is on the left, showing ■ cylinder casting set up with the valve face drilling template clamped on. In this position the holes for bolting on the chest are drilled and tapped. Then the port drilling template is set-screwed on for drilling the ports. This latter template is shown in the foreground. In the centre of the photograph is ■ machined standard casting set up between the foot drilling template and the cylinder cover drilling template. This latter is

male on one side and female on the other, so that it can be used both for cylinder ends and covers.

In the centre of the second photograph of the jigs is a cylinder set up on the communicating-port drilling stand; by swinging the template through 180 deg. the port end clearance is cut with a flat-ended drill. On the left is the bearing drilling jig in which a bearing after it has been machined (base, ends and sides), is placed and the bolting-down holes, oil hole and bearing drilled, and the latter reamed in the one setting. On the right is ■ pair of cylinder-end filing blocks and on their left the cylinder centring plug. This latter is used in conjunction with ■ set-square on the port face to centre-line up the casting after machining. In the foreground is the engine bed template. Items not shown are head-slotting and boring jig and the bottom cover turning mandrel.

All the jigs and fixtures are made from steel, either cased or hardened.

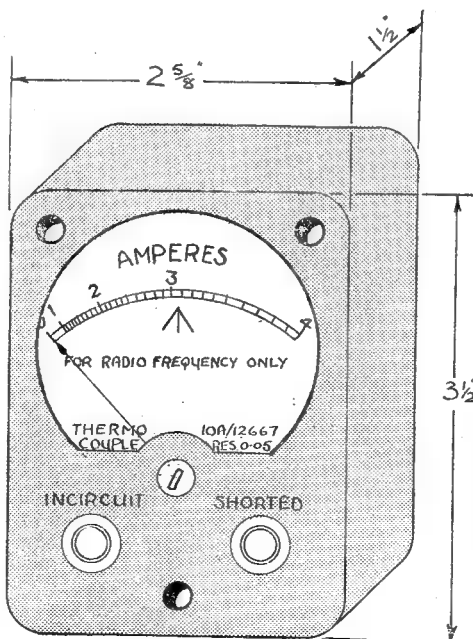
Meter for the Lathe Motor Circuit

by W. Aitken

HAVE you ever wondered, while watching the cuttings curling off the lathe tool, just how much power it was taking to produce those cuttings? An ammeter in the motor circuit is all that is required, but the cost of an instrument transformer, rectifier and moving-coil meter deterred me from trying the experiment until I acquired for ■ few shillings an ex-W.D. hot wire thermocoupled ammeter rated 0.4 A. Across the dial was the legend "for radio frequency only." On looking up an electrical reference book, I found that this type of meter could be used on both d.c. and a.c. circuits of any frequency, but would stand no overload and had ■ comparatively high resistance. Would it, I wondered, serve my purpose. I tried it, and it worked beautifully, and how revealing! With my lathe running free, the current taken by the 1/6 h.p. induction motor was 1.6 A. A moderate cut with ■ sharp tool sent it up to 2 A, and ■ heavy cut with ■ dull tool, to 3 A. I was so inter-

ested in the meter reading that I let the tool dig in, the belt started slipping and the pointer soared to 3.6 A. Dull tools, tight dead centre, ■ too tight steady, all are revealed by the ammeter reading. My meter is now mounted permanently behind the lathe and is consulted frequently, ■

push on the button of the shorting switch built into the meter case, being all that is necessary to bring the meter into operation. It is advisable to short the meter by means of this switch before starting the motor, as the surge of current on starting might burn out the hot wire. The sketch shows the main dimensions of the black bakelite case and the markings on the dial, and should enable one to identify the meter. The resistance, which is 0.05 ohms, will cause ■ voltage drop $E = I \times R = 4 \times 0.05 = 0.2 \text{ V}$, which, in a 240-V circuit, is approximately 0.08%, a negligible amount. This meter is ideal for motors of 1/6 and 1/4 h.p., but is hardly adequate for 1/3 h.p. motors unless they are lightly loaded.



The "Model Engineer"

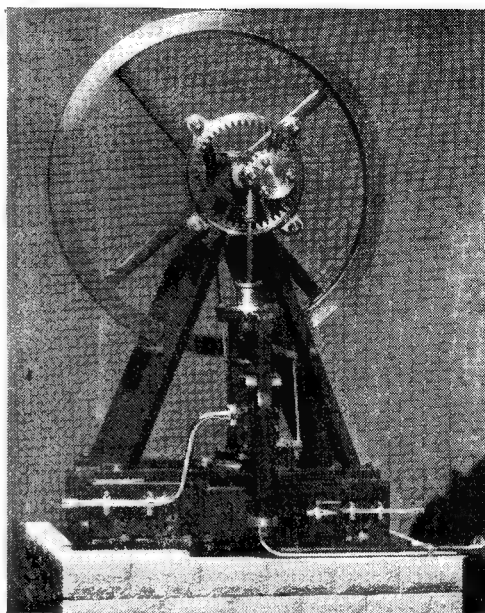
Exhibition

Stationary and Marine Engines

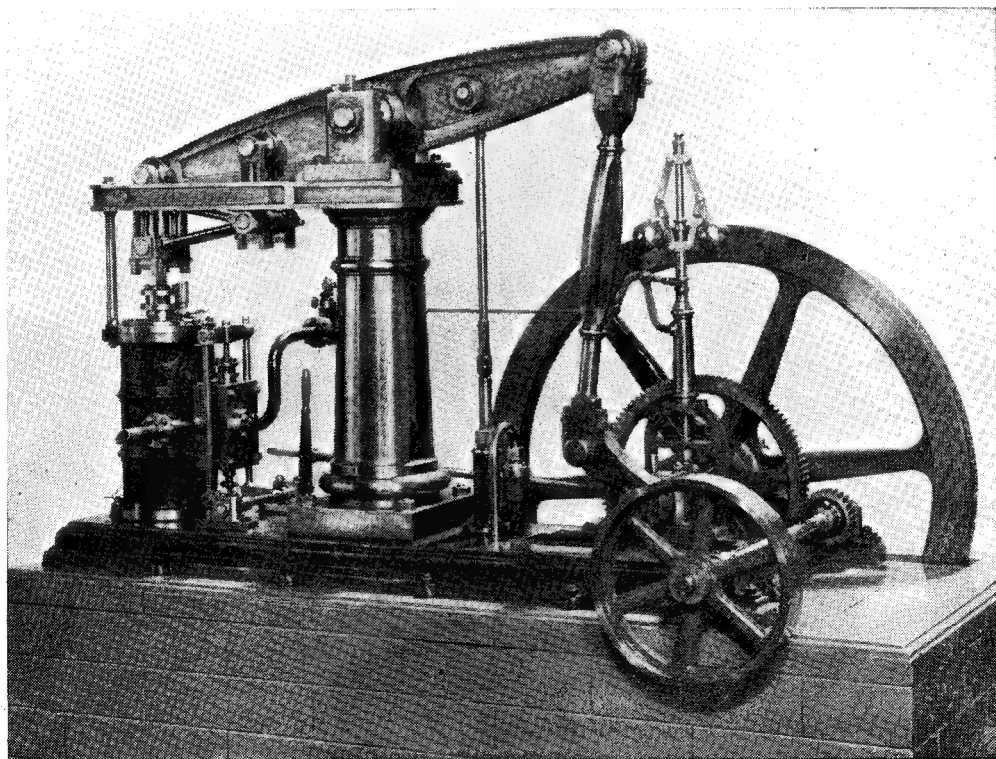
ONE of the signs of progress in model engineering is the gradually widening variety of models which appear at the MODEL ENGINEER Exhibition.

At one period there was some sign of a tendency for exhibition models to become somewhat stereotyped or to fall into well-defined groups. But at the present day, constructors seem to be reaching out for new and more interesting types of models in nearly all classes.

It is always extremely difficult to pick out the outstanding exhibits from the information available to us before the models actually appear at the exhibition, and, therefore, we do not propose to single out any particular entry as being of special interest. In the great majority of cases



*A model of the Murray hypocycloidal steam engine,
by Mr. F. L. Folkard*



The "M.E." beam engine by Mr. L. J. Rowe

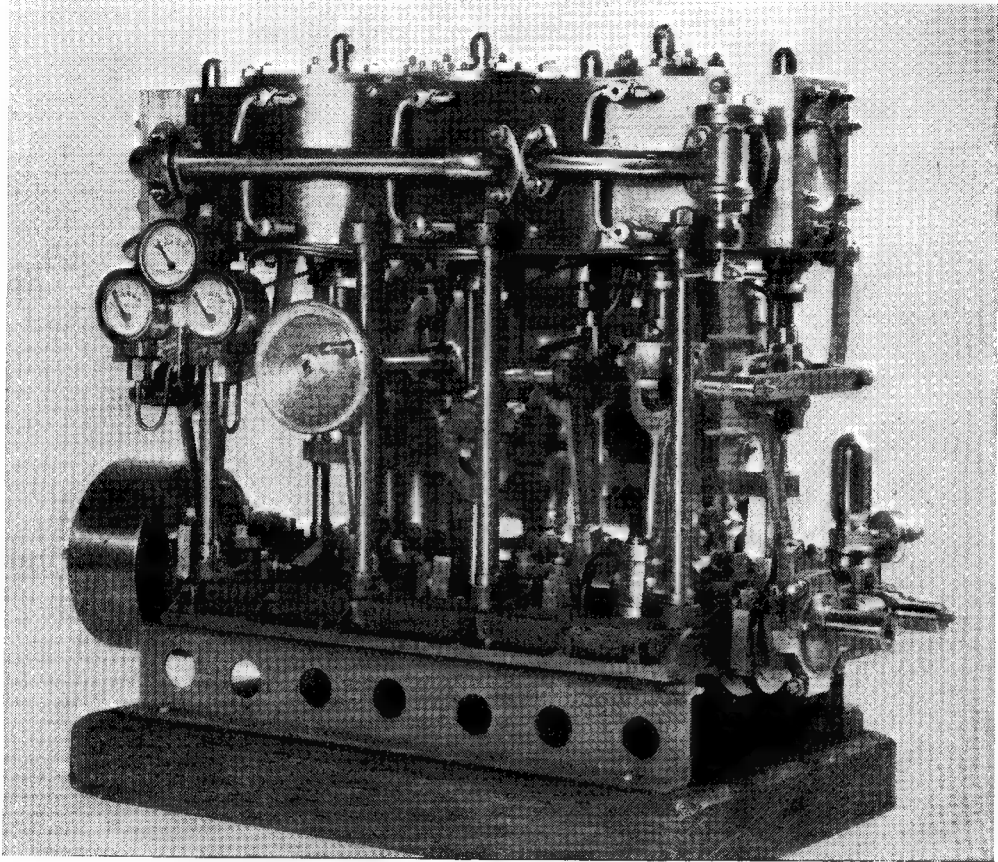
we know very little about the models except the bare description ■ furnished by the entry forms, but we can confidently say that the general quality of the models is well up to standard at this year's exhibition.

What promises to be ■ very interesting exhibit in this section is a model of Murray's hypocycloidal engine, a representation of the engine originally built by Matthew Murray in about 1803,

model of the Hick 2 h.p. oscillating engine, ■ first exhibited by B. Hick & Son, of Bolton, ■ the Great Exhibition of 1851.

This model is exhibited by John Shaw, of Bolton.

Readers will remember the excellent modern example of the "M.E." beam engine, which was exhibited at the MODEL ENGINEER Exhibition two years ago by Mr. R. A. Barker. Interest in



A Stuart Turner triple-expansion engine, by Mr. C. Blazdell

the main feature of interest being the use of ■ hypocycloidal straight-line motion in place of guide bars, or the parallel motion which was more common at that period.

A hypocycloid is the path described by a point on the circumference of ■ wheel rotating in contact with the inside of ■ larger circle. If the latter is exactly twice the wheel diameter the resultant path will be a straight line.

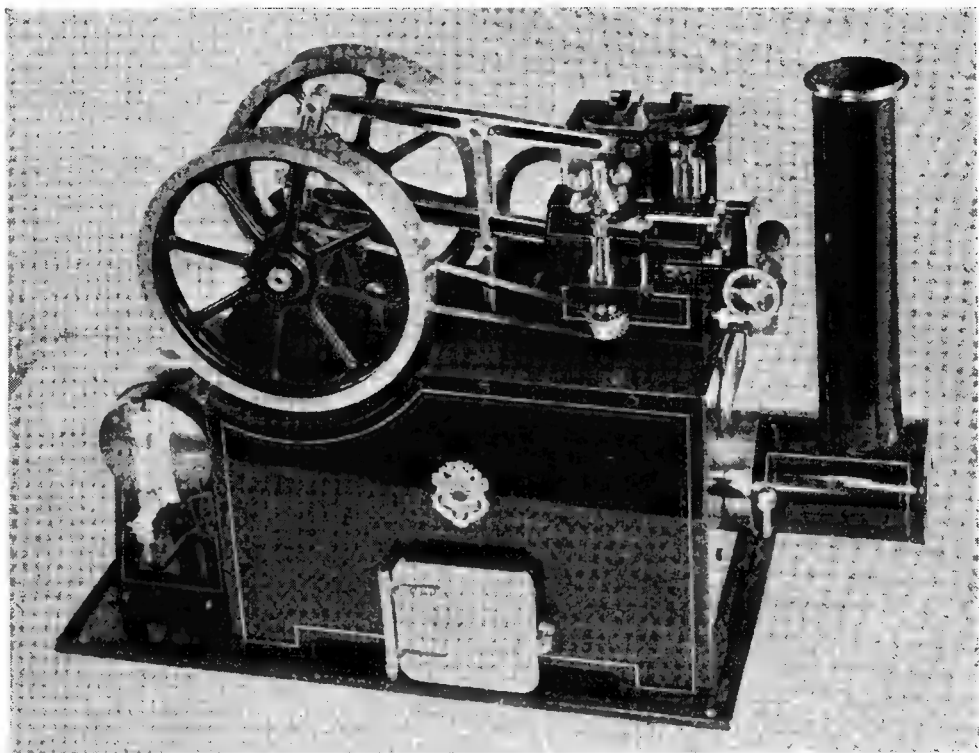
This model is built to ■ scale of 1½ in. to the foot and is of fabricated construction, the valve chest and port face being made separate from the cylinder. The origin of the design is an article by Mr. Ronald Clark, and the model is exhibited by Mr. F. L. Folkard, of Wanstead, E.11.

Another example of a historic engine is the

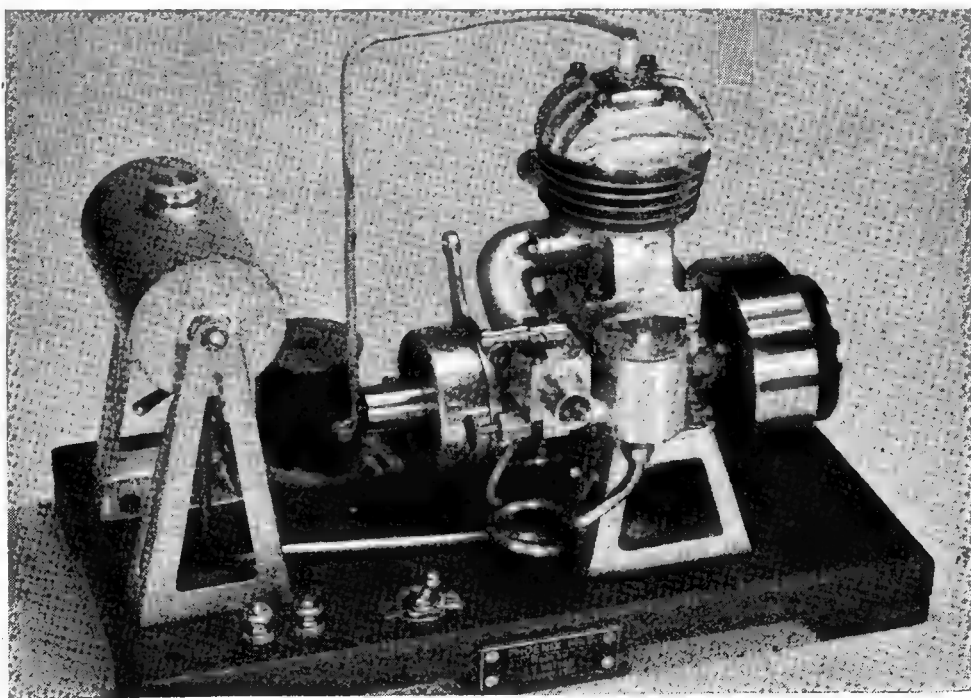
this very fine classic model has been revived and we have heard of several examples now in construction. Mr. L. J. Rowe, of Twickenham, exhibits one at this Exhibition, built from the information in the article by Mr. Barker.

This is his first attempt at serious model engineering.

Mr. F. G. Bettles, of Taunton, Somerset, who is well known to our readers for his collection of traction and portable engine models, exhibits ■ Savage roundabout engine as used to drive three or four pairs of galloping horses, together with its organ engine. This is built to ■ scale of approximately ¾ in. to the foot. It represents the type of engine built from about 1900 to 1910 by the well-known firm of Savages, of King's Lynn.



A spirit-fired hot air engine by Mr. J. I. Bruce



The "Phoenix" 15 c.c. two-stroke engine by Mr. S. E. Hutson

The joint entry by P. W. Bradley and N. H. Rainsley, of Stanmore, Middlesex, is a 1/20 scale working model of a roundabout, which can be dismantled for transport, and packed on trucks as in full size. This is shown together with a road locomotive of the Fowler type, but the latter is not complete in working detail.

A complete set of machinery for a 5 ft. steam tug is exhibited by Mr. Chas. Blazdell, of Gloucester, consisting of a triple-expansion engine built on Stuart Turner castings, coal-fired water-tube boiler with economiser, surface condenser, air, circulating and feed pumps, and an independent steam driven feed pump, also a steam actuated, bilge ejector.

This has taken two years to construct, and is ready piped up for installation in the hull, which is now under construction. It will work on a pressure of 100 lb. per sq. in.

Mr. R. L. Allen, of King's Lynn, exhibits a marine steam plant comprising a non-condensing marine engine $\frac{1}{2}$ in. \times $\frac{1}{4}$ in., built from Stuart Turner castings.

The centre-flue boiler measures 10 in. \times 4 in.

with 2 in. flue and cross tubes, feedwater heater, and superheater.

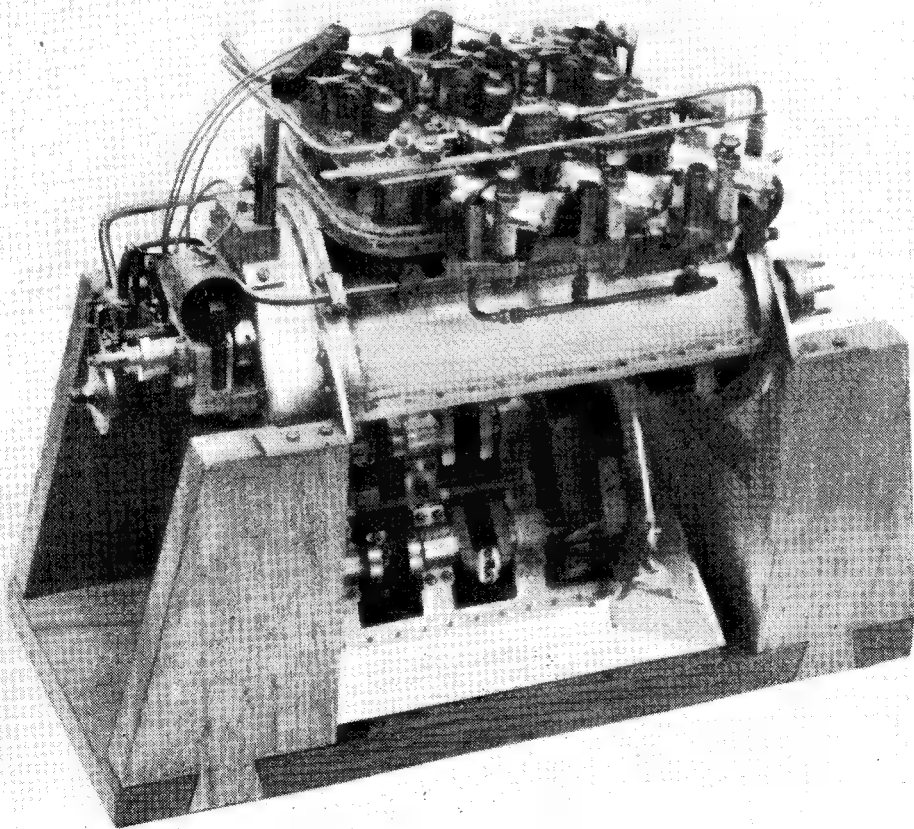
A model of a 90 h.p. launch engine to a scale of 3 in. to the foot is entered by Mr. A. W. G. Tucker, of Bramhall, Cheshire.

This is modelled on the design by T. A. Savery & Co., of Birmingham, which was one of the most advanced examples of quick-revolution open type marine plant.

A type of model well off the beaten track is a "Massey" steam hammer, which is entered by Mr. F. J. Haynes, of Openshaw, Manchester.

This is built to a scale of 1 in. to the foot and is a successful working model with self-acting and steel tilting motion. It has actually been used for practical work, mainly the cogging down of steel ingots for special quality steel tubes. It will work on pressures of 5 lb. per sq. in. and upwards, from either compressed air or steam.

Models of fire-fighting appliances are always a centre of interest at the MODEL ENGINEER Exhibition, and we welcome the working model of a 60-ft. fire escape and hook ladders entered by



The three-cylinder opposed-piston petrol engine by Mr. A. W. Purchas

Mr. A. E. Trussler, of Esher, who has an intimate acquaintance with these appliances, being ■ sub-officer of the local fire brigade.

It represents the "Bailey" type of escape, as used in the fire service, and embodies plumbing gear and sliding undercarriage.

A horizontal steam engine, $\frac{3}{4}$ in. bore by $\frac{3}{4}$ in. stroke is exhibited by Mr. R. F. Richards, of Southampton, also a Stuart No. 9 horizontal engine, $1\frac{1}{2}$ in. bore by $1\frac{1}{2}$ in. stroke, fitted with governors and pump, built by Mr. C. F. Cox, of Swindon.

Mr. J. I. Bruce, of Peterhead, Scotland, exhibits a spirit-fired hot-air engine to the design of Mr. Mark Wyr, published in THE MODEL ENGINEER last year.

Internal Combustion Engines

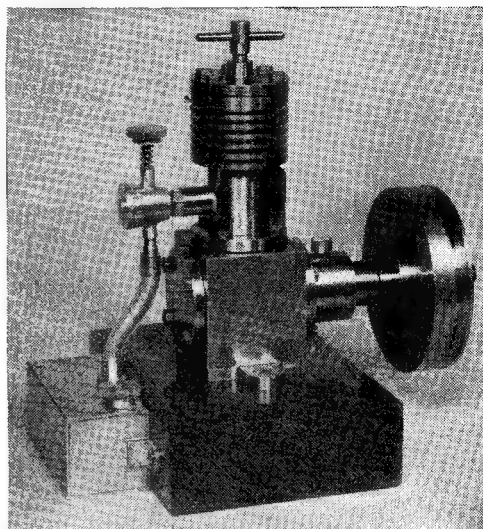
The entries in this section are equally varied, and include many built to designs which have been published in THE MODEL ENGINEER at various times

In this category we may mention the "1831" engine by Mr. A. Brookes, of Culcheth, near Warrington, which was illustrated on the cover of the June 12th issue of THE MODEL ENGINEER, the "Phoenix" 15 c.c. petrol engine, by Mr. S. E. Hutson, of Bexley, the "Seal" 15 c.c. four-cylinder engine by Mr. G. Fletcher, of Barnoldswick, and the "Busy Bee" 50 c.c. auxiliary engine by Mr. A. B. Scorgie, of Aberdeen.

Other models in this section include a three-cylinder opposed-piston marine petrol engine, $\frac{3}{4}$ in. bore by $\frac{3}{4}$ in. stroke, by Mr. A. W. Purchas, of Bishop's Stortford, Herts, ■ 15 c.c. 2-stroke engine for Class "B" hydroplane by Mr. C. J. Chapman, of King's Lynn, and a 3.2 c.c. compression engine by Mr. N. Whitefield, of Wishaw.

Non-Working Engineering Scale Models

A model of Sydney Harbour Bridge to 1/500 scale is entered by Mr. C. N. Balfour, of Tenby, Pembrokeshire. This model was described in the issue of THE MODEL ENGINEER dated May 20th, 1948, and occupies ■ space of 4 ft × 1 ft. × 1 ft.



Mr. Whitefield's 3.2 c.c. compression-ignition engine

Mr. J. Hollins, of Stoke-on-Trent, exhibits ■ 6 in. naval gun to a scale of $\frac{1}{2}$ in. to 1 ft. complete with elevating and traversing gear.

A very well-known veteran model engineer, Mr. Fred Smith, of Pinxton, exhibits ■ model of an electric colliery winding engine to ■ scale of ■ in. to 1 ft. This represents the Metropolitan-Vickers geared winding engine as installed in Pinxton Colliery in 1936, and the data is taken from the actual engine, which was installed to replace an old single-cylinder vertical steam engine which had carried out its duties from 1852 to 1936. The model is driven by a motor fitted underneath the base.

Mr. P. L. Cowe exhibits ■ model of a V2 rocket and maintenance gantry, built from data obtained from a photograph in the *Geographic Magazine*.

For the Bookshelf

Locomotive and Train Working in the Latter Part of the Nineteenth Century, by E. L. Ahrons. (Cambridge: W. Heffer & Sons.) 113 pages. 48 illustrations on art-paper inserts. Price 15s. net.

Volume 3 of these reprinted articles has just come to hand, covering the five principal Scottish railways, viz.: Glasgow & South Western, Caledonian, North British, Highland and the Great North of Scotland. We find that the standard set by the two previous volumes is maintained, and we believe that there are fewer

deletions from the originals. The 48 photographs from which the illustrations have been reproduced have been well chosen, though, in all sections we could mention a few that might have been included. The majority of those used, however, are excellent, especially the lower one facing page 50, which must be one of the finest photographs of ■ "Dunalastair" ever taken.

In dealing with the Scottish railways, the late E. L. Ahrons allowed full rein to his good-natured sense of humour, which makes this volume highly entertaining to read.

An Unusual 2½-in. Gauge Locomotive

by V. H. Messer (Australia)

I HAVE always thought that photographs and details of ■ model or any piece of work in an unfinished state are more interesting than a picture of the job complete with painting and lining ; accompanied by the usual description—cylinders so and so by so and so—boiler, such and such a diameter, etc.

With this in mind, I submit ■ few photographs

universal joints and square “spline” shafts, the final drive being the 2 to 1 bevel gears—two revolutions of the engine to one revolution of the driving axles.

The photographs were taken with ■ old “Thornton-Pickard” half-plate field camera. I gathered all the “bits and pieces” and put them together temporarily to give some idea of



A “Shay” locomotive in Australia, hauling cane

of an unusual type of locomotive in 2½-in. gauge, and approximately ¾-in. scale. This “contraption,” ■ our society’s locomotive purist calls it, is ■ the whole, free-lance, and I have not slavishly followed any particular prototype, but when finished, it will, I hope, look right and work right.

“Shay” patent locomotives are built by the Lima Locomotive Corporation, U.S.A., and are used on narrow-gauge logging railroads in America ; large specimens were supplied to the Pekin-Kalgan Railway, and the largest built for the Kansas City Southern. This weighed 160 tons, has a tractive effort of 74,400 lb. and hauls 200 tons up ■ bank of 1 in 14.28 !

Here in Australia, we have a few “Shays” in the Queensland sugar plantations (see photograph)—these have two cylinders only. Shay locomotives are designed for very light, curly, and often roughly-laid track, they are powerful machines for their size ; it is claimed by some people that they are able to climb trees !

The three-cylinder (simple) engine is geared ■ to 1 down to all axles and the wheels are small in diameter, some have only two geared trucks or bogies, whilst the larger jobs have three trucks, the third under ■ water tank or tender. All axles ■ coupled to the engine crankshaft by

what it would look like when finished ; and ■ “L.B.S.C.” says, light plays funny tricks with bright metals of ■ dissimilar colour. The cab is bright steel and the water “bunker” or tank is constructed of brass. The three-cylinder engine will look nicer when lagging and drain cocks are added.

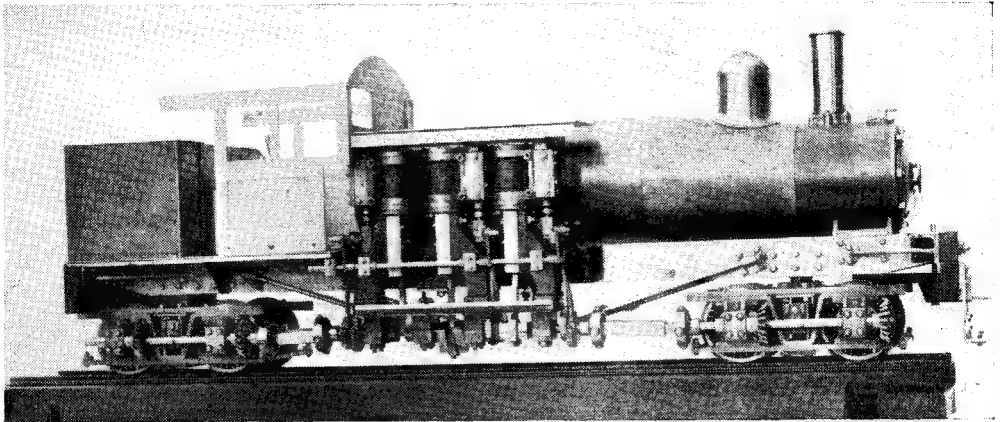
The parallel part of boiler barrel is 3½ in. dia., smokebox 3 in. dia. The “insides” of the boiler are strictly to “L.B.S.C.” specifications ; you can’t improve on ■ “Curly” kettle. I found that out ■ long time ago.

The job really started from the time a friend presented me with four pairs of steel bevel gears ; they were biograph gears and these were turned down to reduce the width, bushed and pressed on to gear shaft, and pinned to make sure. The whole job was designed around the gears.

Cylinders are ½ in. bore, ¾ in. stroke, three-throw crankshaft is built up and brazed, and patterns were made for cylinder supports, bearings, etc. The three sets of Stephenson’s link motion caused much disturbance of grey matter ; there was little room for the centre set.

As six eccentric straps were wanted, I tried a new way, and I now pass it on for what it is worth ; it certainly saves time.

Make pattern as A in sketch and get two off in



Side view of unfinished model

gunmetal or bronze, file or machine away the eccentric-rod face from *one*, as shown at *B*, clean up joint faces, soft-solder together and clean up end and set out bore, at the same time cleaning up outside shape with files, as shown at *C*.

Set up in four-jaw chuck or Keats V-angle plate, bore and ream to fit sheaves, *D*.

Part off with thin parting tool, drill holes for bolts, number and hold over bunsen to melt solder as shown at *E*, and there you are. Eight straps were made from one length, so I had two spares.

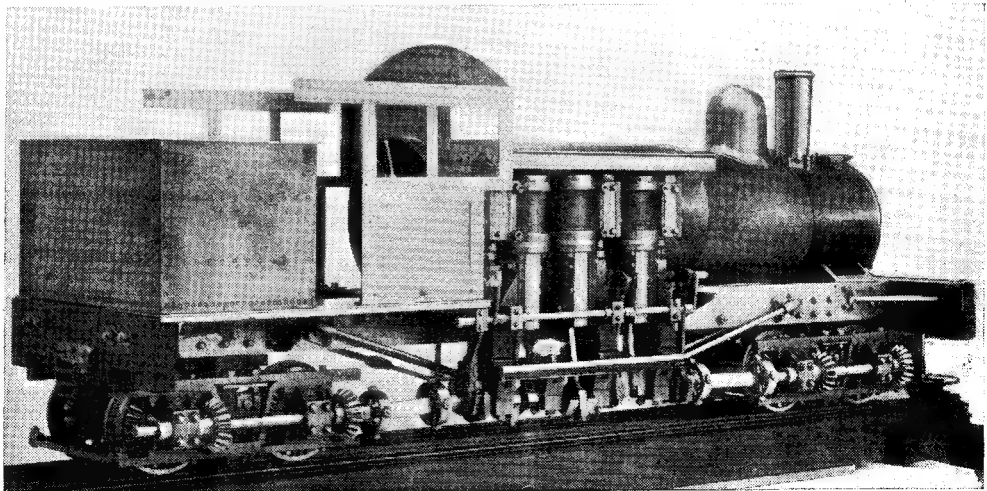
Frames

These were cut out of 1 in. \times $\frac{1}{4}$ in. bright mild-steel and have double tie-rods each side, five stretchers take care of any twisting. The engine is secured to frames by six long bolts and clips; this obviated drilling holes in the rather narrow frames and allows for adjustment, fore

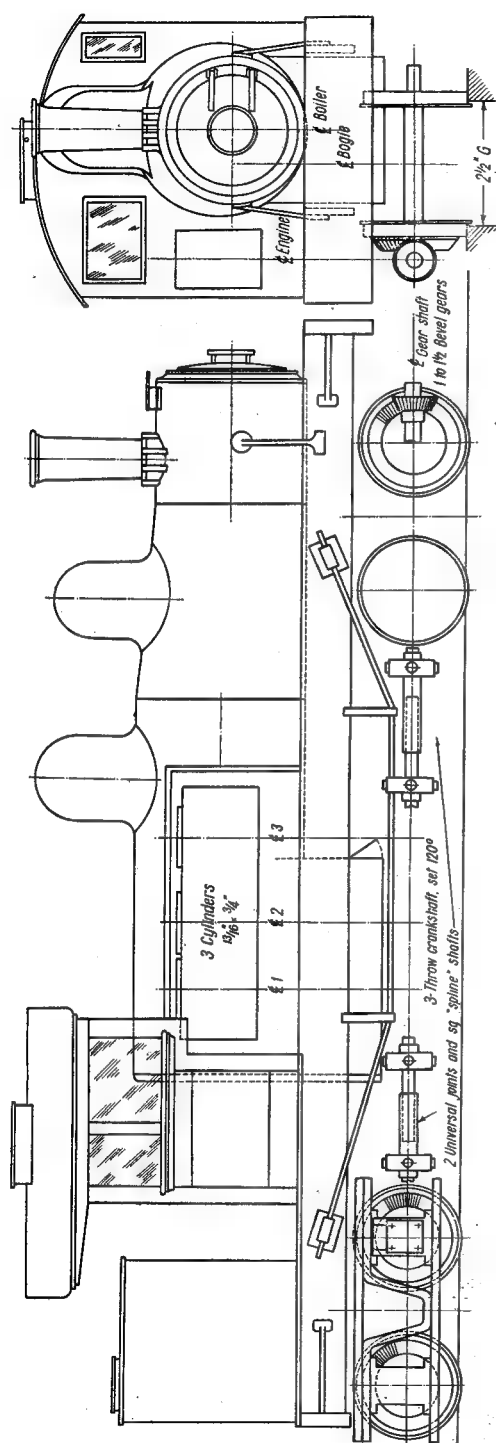
and aft, of engine. The empty space between engine and front buffer beam will be filled in with cylinders; running-board and air tank are of gunmetal with bronze pistons, valves are of German silver; crossheads, gunmetal; and guide bars, mild-steel. The valve-rod guides were built up, using silver-solder; connecting-rods—mild-steel with gunmetal big-ends; note the four big bearings for crankshaft. Steam will come from regulator in large dome to manifold on top of steam chests, and exhaust from manifold to smokebox.

Testing

The valves were carefully set, pistons and glands packed and the engine tested; using compressed air, this was done before the Johnson bar (reversing lever) was made and fixed in the cab. I then found that when the lever was pulled over to forward position, the engine was in



This view gives a clearer idea of gear layout



reverse, so now I have to pull engine down and reset valves—I say, I am a fool!—it sure pays to think well before sailing into a job.

The connecting-link between reversing lever and arm of reversing shaft has a ball-and-socket joint at each end; this was necessary, the lever is fixed at 90 deg. to arm on reversing shaft.

Buffer beams are mahogany and link pockets have three slots. This, I suppose, is for "foreigners," or rolling stock with different coupling heights.

The outline drawing of the model is mostly diagrammatic and without "trimmings." I have not shown the complete layout of the drive, but if the reader starts from the left, No. 1 driving wheel shows an indication of large bevel gear recessed into driver, No. 2 shows bearing of gear shaft, No. 3, just the outline of wheel and No. 4 shows the small bevel gear; a better idea of the drive can be obtained by looking at the photographs.

The last two photographs show the engine at the time of writing. It was rather hurriedly completed so as to be ready in time for an exhibition, and I intend to add brake-gear and a few other refinements later.

Painting

I am not at all pleased with the photographs—the glossy enamel distorts the plate work and wrinkles appear in places where the metal is perfectly smooth, and note the reflections of a tree on smokebox door and tops of domes! I tried unsuccessfully to procure an enamel with a matt or egg-shell finish and was informed that such a paint was not manufactured.

Drain Cocks

Quite a lot of time was wasted trying to make small cylinder drain cocks; I gave this up in disgust. The smallest was too large and quite out of proportion, so simple drains were made with a No. 64 hole in centre of screwed end almost up to the shoulder, this was met by a hole drilled at right-angles from the side; bent handles were silver-soldered on and with one turn the hole in the side is exposed and releases the condensed water from the cylinder. I am still not satisfied; they are too large and look clumsy.

Boiler Details

The boiler is as described for "Juliet" except for the tapered front end, and the larger diameter in the straight part of the barrel. The firebox is $\frac{3}{4}$ in. deeper than "Juliet's"; the ashpan is only $\frac{1}{2}$ in. from head of rail. The whole job was silver-soldered, excepting stays, and tested to 150 lb. per sq. in. The regulator is under the large dome, with regulator-rod outside. This is quite in order. I have photographs of locomotives with this arrangement including a "Shay." The regulator is very easily exposed; just disconnect steam joint at flange and lift dome.

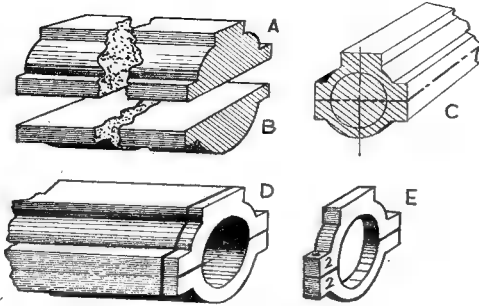
Note the cunning way that the smoke stack is secured, six No. 10 B.A. bolts, making it quite easy to remove.

Odds and Ends

Buffer beams are real mahogany; the rather

large nuts and washers will be replaced by smaller ones later. The headlamp is a fairly close copy of an American paraffin-burner; and the bell, although turned and bored until very little metal is left, only "tinkles"; something that can't be scaled down!

On the big "Shays" the gears on the side shafts have a shield or cover over them. I expect this is to stop the gears snatching at the switch-

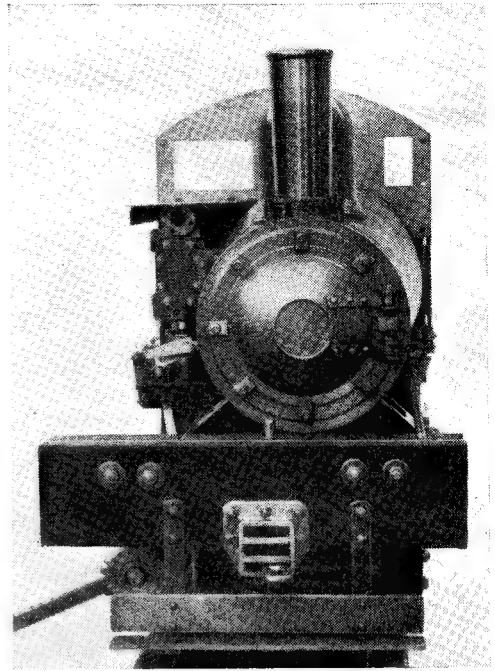


A new way of constructing eccentric straps

man's trouser cuffs! I have not fitted these shields—it is nice to see all the "works"!

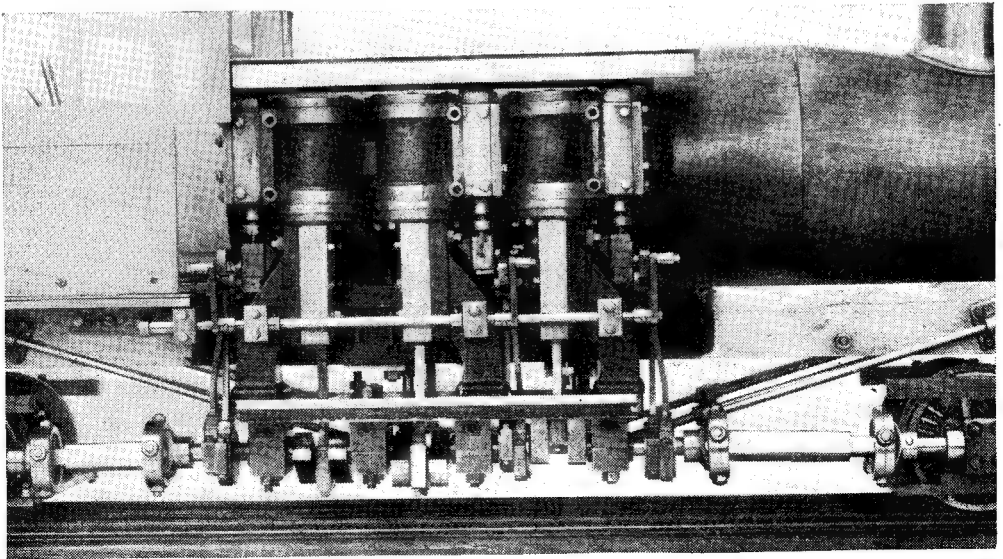
The reader will notice that the crankshaft is almost completely embraced by the four large bearings; this, I think, is a good thing.

The cab is very wide—almost large enough for the engineer and fireman to sit down to a table for lunch; on the model the windows slide in runners and the front ones open.

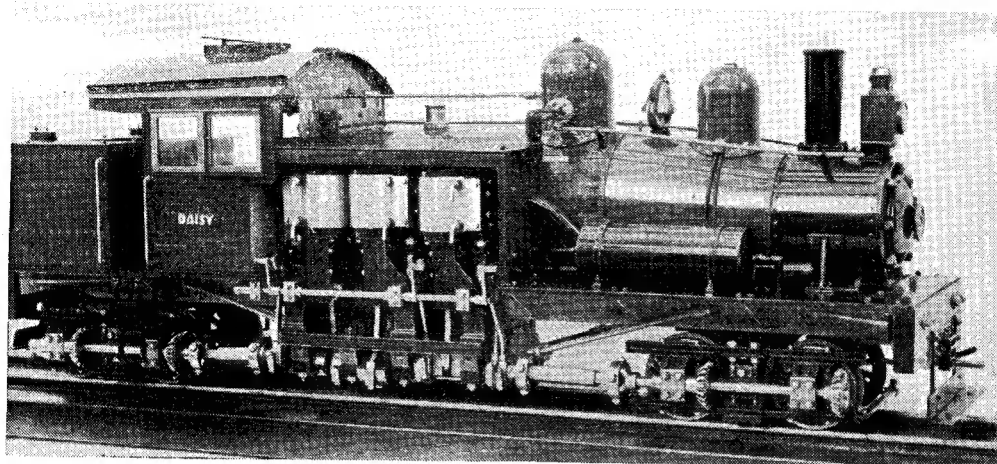


View showing offset boiler

The "port" side is almost naked, the Westinghouse pump, (dummy) and sand pipes only break the plain stretch of boiler.



Close-up of cylinders, crankshaft etc.



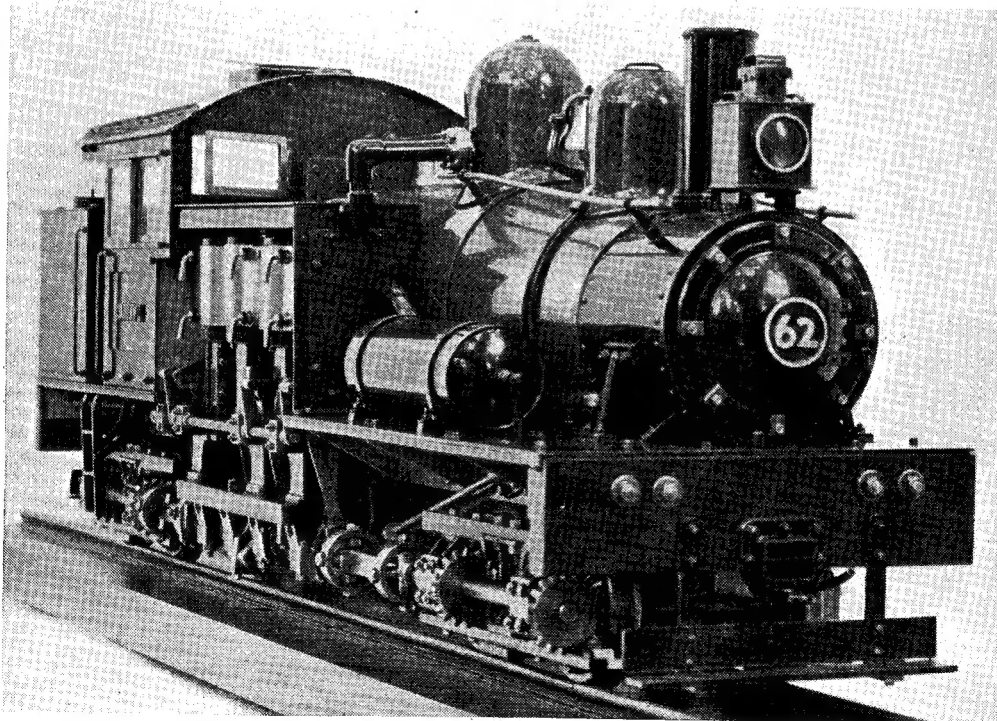
The model practically finished

On the track she looks very much like a crab when that crustacean decides to walk sideways!

The building of this unusual type of locomotive, with all its problems, has been most interesting. I was rather tickled when, after carefully erecting engine unit on frames, I was able to pass a straight length of silver-steel rod right

through the eight bearings—four on the bogie sides and four on engine "bedplate."

In conclusion, I would like to suggest to builders of small locomotives that they study the possibilities of unusual types. I find that a change from the conventional outside cylinder machine is like visiting places one has never seen before—fresh interests all around.



Massiveness in 2½ in. gauge

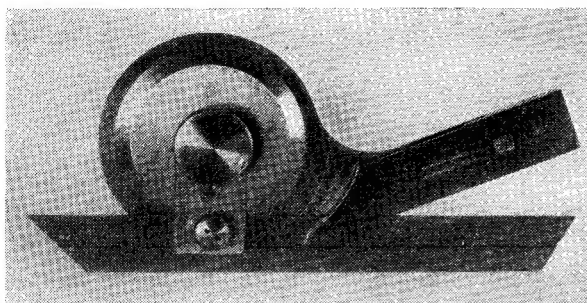


Fig. 1. The Brown & Sharpe protractor set to 20 deg.

A Protractor Attachment for Measuring Small Tapers

ABROWN & SHARPE protractor has been in use in the workshop for many years, and there has always been the same difficulty when it came to measuring parts with only a slight taper, for the instrument is not designed for this work and will not measure conveniently, if at all, tapers of less than 20 deg. included angle.

A way out, but rather a lazy one, is to clamp a square to the blade of the protractor. The improved pattern of this make of protractor has an extra limb for mounting a special attachment, which lies parallel with the stock of the instrument when the scale is set to zero.

However, the range of movement of this attachment is rather limited for use with work of large diameter. When it came to designing an attachment for measuring tapers of small angle on both large and small work, it was decided to mount the attachment on the blade of the protractor, so that the maximum span was increased to nearly 3 in.; moreover, the protractor scale conveniently reads zero when the measuring limbs are set parallel.

The first question to arise was how to clamp the attachment to the protractor blade, but as nothing could be neater or more effective than the Brown & Sharpe method of clamping the blade to the rotor of the instrument, it was decided to follow this mode of construction. Briefly, in this device, a small, knurled finger-nut turns a pivot with an eccentric head, and this head turns in a hole drilled in a small, L-shaped clamping plate.

The short limb of the "L" slides in the groove machined in the protractor blade and, when the finger-screw is turned, the clamp plate is moved inwards and so locks the blade firmly in position.

Making the Attachment

The blade (A) is made from a strip of mild-steel $\frac{5}{8}$ in. \times $\frac{1}{4}$ in., and it is not cut to the finished shape until after all the parts have been assembled, but the working edge should be filed square and straight at the outset. The curved part (B), forming the stock, is cut from 16 gauge sheet steel and, again, the working face should be filed true at this stage. The keep plate (C) is made from a piece of the same material as the blade and is cut off roughly to length.

The next step is to clamp the three parts together on the blade of the protractor with tool-maker's clamps and, at the same time, the blade

(A) is set exactly at right-angles by being butted against the protractor stock. The three screw holes are first drilled right through all the parts with a No. 38 drill, and are afterwards opened out to $\frac{1}{8}$ in. diameter for a depth of $\frac{1}{16}$ in. to give clearance for the 5 B.A. fixing screws; in this way, some guidance will be provided for the tap when threading the holes in the blade. When the clamps have been removed and three temporary 5 B.A. screws inserted, the attachment should be a good, smooth sliding fit on the protractor blade.

The keep plate (C), when in position, can now be marked-out for the clamp piece (D) and for the bearing hole of the clamp-crew; the part is then machined accordingly, or the slot for

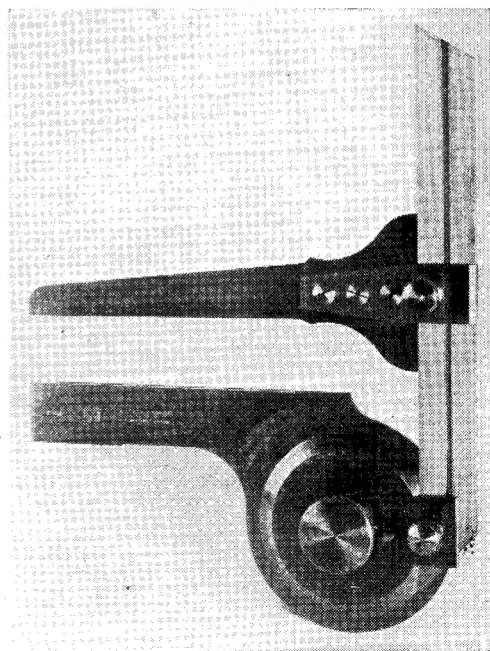


Fig. 2. The attachment clamped to the protractor blade

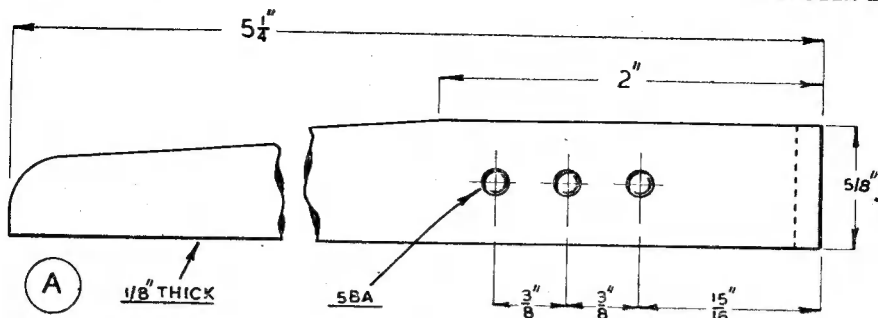


Fig. 3. The blade of the attachment

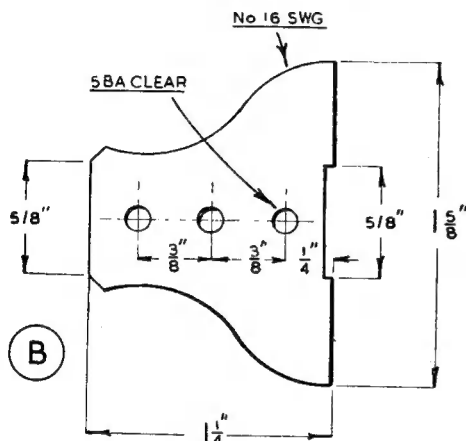
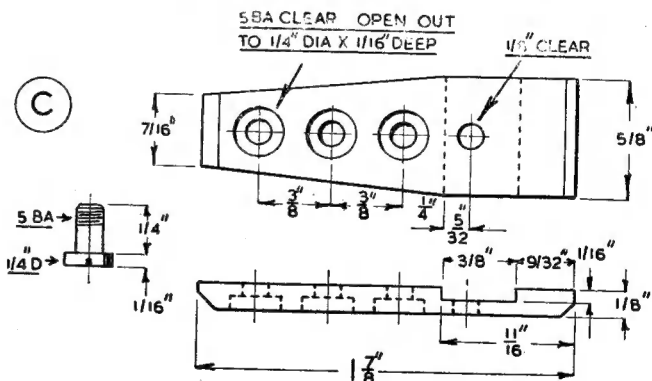


Fig. 4. The stock fitted to the blade

the clamp plate can be filed to shape. The clamp-piece should, at first, be made to fit firmly in its slot and, at the same time, the projecting head should fit into the groove in the protractor blade. With the parts screwed together and clamped at the outer end to the protractor blade with a tool-maker's clamp, a $\frac{1}{8}$ in. diameter drill is entered in the hole already drilled in the keep plate, and the hole is continued nearly through the clamp-piece. The hole in the clamp-piece is then opened out to $\frac{3}{16}$ in. diameter and is lightly countersunk at its lower end, as shown in the drawing, to an included angle of approximately 90 deg.

To allow the clamp-piece to move inwards and lock the attachment to the protractor blade, the inner end of the clamp-piece should be filed down some 10 thousandths of an inch.



Right—Fig. 5. The keep plate and fixing-screws

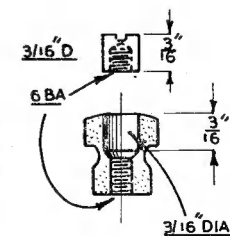
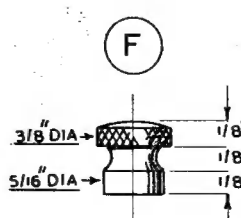
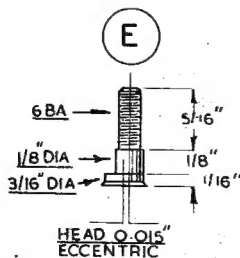
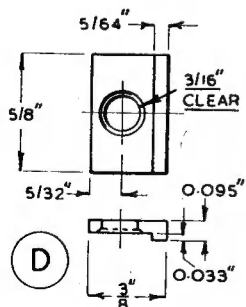


Fig. 6. "D"—the clamp-piece ; "E"—the clamp-screw ;

"F"—the clamp-nut and thimble

The clamp screw (E) is turned from $\frac{1}{4}$ in. diameter silver-steel rod held in the four-jaw chuck, and the eccentric head is machined after the chuck jaws have been reset so as to give a total run-out of approximately 30 thousandths of an inch, as measured with a test indicator mounted on the lathe bed. The head of the screw is best turned with a V-tool, set to an angle of 45 deg., so as to form the shallow countersunk end engaging the corresponding countersink in the clamp-piece. The finger nut (F) and its small locking thimble are straightforward machining jobs, but it should be noted that the end-plate is just taken

up when the finger nut is screwed firmly home. After the three screw holes in the keep plate have been counterdrilled, as shown in the drawing, the permanent fixing-screws are fitted with their heads lying flush. When the attachment has been assembled and found to work satisfactorily on the protractor blade, the three major parts can be filed to the finished shape and then polished.

Should there be any error of parallelism between the blade of the attachment and the protractor stock, with the protractor scale set at zero, this can readily be corrected by carefully filing the working edge of the stock (B) of the attachment.

CLUB ANNOUNCEMENTS

The Farnborough Society of Model Engineers

The following list of club events has been arranged:—
Saturday, October 25th. Visit to Longmoor Military Railway.

Sunday, November 16th. Visit to G.W.R. sheds at Reading.
Thursday, November 27th. First annual general meeting at 7.30 p.m.

Meetings take place every Thursday evening from 7.30 p.m. onwards.

New members are always welcome, especially those interested in ship modelling. Affiliation to the M.P.B.A. has been applied for.

Our club-house and workshop are situated at the rear of 69, Farnborough Road, Farnborough, and full details can be obtained from the Hon. Secretary, D. L. JENKINS, 16, Hurst Road, Hawley Estate, Farnborough, Hants. Phone 1911.

Trowbridge and District S.M.E.

The society will be holding its fourth annual exhibition at St. James Hall, Union Street, Trowbridge, from 12-9.30 p.m., on Friday, November 7th and from 10 a.m.-9 p.m. on Saturday, November 8th. Small gauge layouts are being developed to operate, whilst the usual wide variety of models of all types will be on show.

The society has developed a strong section in Warminster where it is planned to open a workshop shortly. A very successful exhibition, mainly of members models was held in Warminster Town Hall during August. More local members would be welcomed to make use of the well-equipped workshop already operated in Trowbridge.

Hon. Secretary: R. GODDARD, 22, Cherry Gardens, Trowbridge.

Aylesbury and District Society of Model Engineers

The September meeting was devoted to the Luton S.M.E. Mr. Gower, one of their members, gave a talk on cutting locomotive parts from the solid. To illustrate his talk he showed us parts of the very excellent L.M.S. Class 5XP he is making in $2\frac{1}{2}$ -in. gauge. There were some lively exchanges between Mr. Gower and Mr. Fraser, another visitor, and an old friend of Aylesbury. Mr. Fraser is an advocate of the built-up, silver-solder method of construction.

Hon. Secretary: E. H. SMITH, Mulberry Tree Cottage, Devonshire Avenue, Amersham, Bucks.

The Northern Association of Model Engineers

The Northern Association of Model Engineers, meet on the first Saturday in every month, in the Milton Hall, Deansgate, Manchester, at 2.30 p.m.

The Society of Inventors, Manchester, meet on the second Tuesday in every month in the Onward Hall, Deansgate, Manchester, at 7.30 p.m.

Hon. Secretary: RALPH WOODS, M.C.A.S., "Lilstock," Middleton Road, Hopwood, Heywood, Lancs.

Grimsby and District Society of Model and Experimental Engineers

The above society are holding an exhibition of models and handicrafts at the Augusta Street Barracks, Grimsby, from December 1st to 6th inclusive.

Prizes and diplomas are offered in all sections and a championship cup for the best model in the exhibition. Entries are invited from societies or lone hands; and we collect wherever practicable or assist with transport charges. All items are fully insured.

Hon. Secretary: J. TARTTELIN, 101, Ladysmith Road, Grimsby.

A Diary of Coming Events for October and November, 1952

October 23rd, 24th, 25th, 27th, 26th, 29th.—"The Model Engineer" Exhibition at the New Royal Horticultural Hall, Greycoat Street, Westminster, London, S.W.1. Open from 11 a.m. to 9 p.m.

October 23rd till November 1st.—Tyneside Society of Model and Experimental Engineers.—Exhibition at the Chronicle Hall, Pudding Chare, Newcastle-upon-Tyne.

October 24th, 25th.—Buxton Model Engineering Society.—Exhibition at the Hardwick Square Schools, Buxton, Derbyshire.

October 26th, 29th, 30th, 31st, November 1st.—Brighouse Society of Model and Experimental Engineers.—Exhibition of models at Park Schools. Opening 10.30 a.m. to 9 p.m. Tuesday to Friday; 10.30 a.m. till 9.30 p.m. Saturday.

October 31st, November 1st.—Chester Model Railway Club.—Exhibition at the Town Hall, Friday, 6 p.m. to 9 p.m.; Saturday 10 a.m. to 9 p.m.

November 7th, 8th.—Trowbridge and District Society of Model Engineers.—Annual exhibition at St. James Hall, Union Street, Trowbridge. Open from 12 noon to 9.30 p.m. on November 7th and from 10 a.m. to 9 p.m. on November 8th.

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